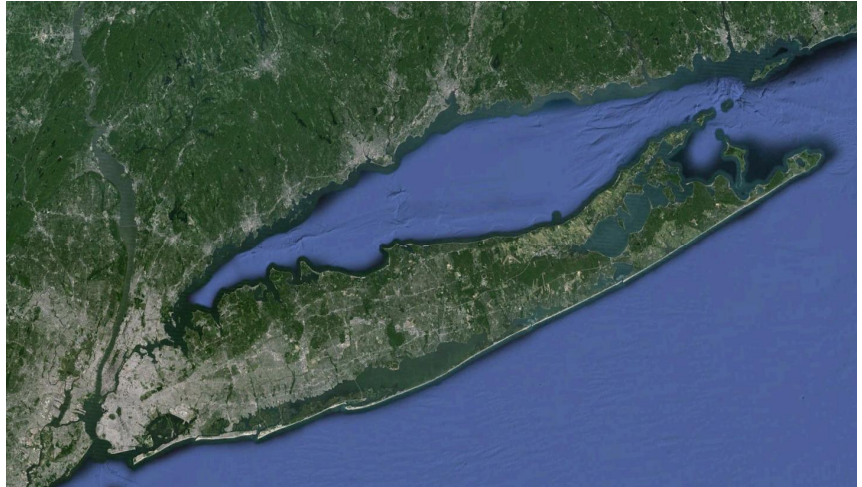




**LIDAR GROUND
CONTROL
FINAL SURVEY REPORT**



**LONG ISLAND, NEW YORK
SANDY LIDAR**

USGS/NGTOC

CONTRACT NUMBER: G10PC00057
ORDER NUMBER: G14PD00296

WOOLPERT PROJECT #74257
November 2014

**PREPARED BY:
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Lidar Ground Control Final Survey Report

USGS/NGTOC

Task Order: LONG ISLAND, NEW YORK - SANDY LIDAR

Contract Number G10PC00057, Order Number: G14PD00296

Woolpert, Inc. Project Number 74257

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Introduction

This report contains an outline of the ground control surveys that supported the topographic lidar along the Atlantic coast of Long Island, New York; Contract Number G10PC00057, Order Number G14PD00296; Woolpert Number 74257.

Project Area

The project area encompasses over 1,225 square miles in Suffolk and Nassau Counties in New York.

Purpose

The purpose of this survey was to establish three-dimensional coordinates for airborne sensor system calibrations and ground-truthing in support of topographic lidar data acquisition on Long Island, New York.

Date of Survey

All ground control field operations took place between April 16, 2014 and April 22, 2014.

Existing Project Control

Prior to the LIDAR mission, Woolpert staff researched suitable NGS and KeyNetGPS stations staggered throughout the project limits. KeyNetGPS stations were KP18, MTG1, NYCI, NYQN and NYRH. Woolpert crews also performed reconnaissance on existing NGS control stations 11 E 12 N, Q 334 and U325 to compare resulting coordinates when processed with KeyNetGPS stations.

Ground Truthing and Calibration Sites

Information sheets for the newly established photogrammetric control stations can be found in Section 3 of this report. These information sheets consist of photographs, description of the point observed, and geographic coordinates. A diagram showing the ground control stations used to support this photogrammetric mapping project can be found in Section 5 of this report.

Methodology

The type of GPS survey technique that was performed for this project was Real-Time Kinematics (RTK) GPS. Conventional survey methodology was used as well in obscured areas.

Real-Time Kinematics (RTK) GPS

The field crews utilized RTK GPS by accessing real time corrections provided by KeyNetGPS via an internet connection in the field. RTK GPS is a technique used in land surveying based on the use of carrier phase measurements of the GPS and GLONASS signals where a network of reference stations provide the real-time corrections, consistently producing centimeter-level accuracies. This methodology allowed for efficient survey grade observations for sensor calibrations and ground-truthing. Woolpert utilized Trimble Navigation R8 dual-frequency geodetic GPS receivers on the rover end of the vector for this task. The survey was conducted using a 1-second epoch rate, in a fixed solution RTK mode with each GPS session lasting 90 seconds to 180 seconds each.

Datum Reference and Final Coordinates

All horizontal GPS control was based on the Universal Transverse Mercator (UTM) Zone 18, referenced to the North American Datum 1983, National Re-adjustment of 2002 (NAD83/2002). All vertical control was based on the North American Vertical Datum of 1988 (NAVD88). These final coordinates for the ground control survey are expressed in Meters and can be found in Section 2 of this report.

GPS Data Analysis and Processing

All session baselines were processed each day using *Trimble Navigation's* Trimble Business Center (TBX) version 3.1 baseline processor with the broadcast ephemeris.

Daily processing allowed immediate feedback to field crews to discover any weak links in the network and immediately schedule re-observations of the affected baselines. Once the fieldwork was complete, the processed baselines were then run through a rigorous loop closure analysis.

RTK-Rapid Static GPS Adjustment

Upon completion of all field data processing, Woolpert constrained to KeyNetGPS stations KP18, MTG1, NYCI, NYQN and NYRH using *Trimble Navigation's* Trimble Business Center (TBC) version 3.1. Geoid 12A was used to model the elevations.

Conventional Survey

Where obstructions precluded Woolpert crews from using GPS conventional survey methods were utilized. All conventional survey observations were referenced to control established from RTK GPS methods.

Accuracy Specifications

The final analysis of the GPS network indicates that the GPS and conventional survey observations used for ground-truthing and sensor calibration meet or exceed the accuracy criteria set forth in the statement of work.

SECTION 2: GROUND CONTROL COORDINATE LISTING

This section contains a complete listing of the Final UTM 18 Coordinates, Orthometric Heights, Latitude, Longitude, Station Descriptions and Locations for the USGS/NGTOC Long Island New York Sandy Lidar Project:

USGS/NGTOC

Long Island, New York Sandy Lidar

Horizontal Datum: NAD 83 (2011), Vertical Datum: NAVD 1988
Units: Meters, Coordinate Zone: UTM 18, Geoid Model: Geoid 12A
Date: April 2014

Lidar Quality Control Check Points

Point No.	Northing	Easting	Elev.	Latitude	Longitude	Surface Desc.	Location
2001	4571625.437	750404.645	11.679	41°15'26.14707" N	72°00'40.02370" W	Short Grass	Suffolk County, New York
2002	4573956.325	752972.470	4.947	41°16'38.75042" N	71°58'46.34828" W	Short Grass	Suffolk County, New York
2003	4557223.194	722416.297	14.359	41°08'09.07481" N	72°21'00.22861" W	Bare Earth	Suffolk County, New York
2004	4543864.274	710791.081	8.847	41°01'07.43910" N	72°29'34.85123" W	Bare Earth	Suffolk County, New York
2005	4534535.212	673331.046	43.923	40°56'36.87845" N	72°56'27.04111" W	Short Grass	Suffolk County, New York
2006	4526114.062	646920.721	37.002	40°52'22.53909" N	73°15'23.18007" W	Bare Earth	Suffolk County, New York
2007	4533425.211	628161.552	1.814	40°56'30.89753" N	73°28'38.89442" W	Bare Earth	Suffolk County, New York
2008	4524733.643	623775.486	17.311	40°51'51.55533" N	73°31'52.65256" W	Short Grass	Nassau County, New York
2009	4516217.587	609287.473	7.008	40°47'22.86355" N	73°42'16.75619" W	Bare Earth	Nassau County, New York
2010	4508129.312	613910.712	23.188	40°42'58.36408" N	73°39'04.83854" W	Bare Earth	Nassau County, New York
2011	4499581.178	615819.059	3.637	40°38'20.25674" N	73°37'49.19847" W	Bare Earth	Nassau County, New York
2012	4499156.369	649349.172	4.694	40°37'47.10905" N	73°14'02.64572" W	Bare Earth	Suffolk County, New York
2013	4512127.196	679613.262	0.824	40°44'25.79357" N	72°52'21.80412" W	Bare Earth	Suffolk County, New York
2014	4528218.486	674866.569	28.378	40°53'10.98323" N	72°55'27.81979" W	Short Grass	Suffolk County, New York
2015	4532366.742	726714.653	5.681	40°54'39.60580" N	72°18'28.92621" W	Bare Earth	Suffolk County, New York
2016	4551270.114	756925.711	2.111	41°04'19.62878" N	71°56'30.90555" W	Bare Earth	Suffolk County, New York
2017	4542256.645	727346.880	0.649	40°59'59.34582" N	72°17'48.86098" W	Bare Earth	Suffolk County, New York
2018	4529918.422	711091.494	13.767	40°53'35.33073" N	72°29'39.11306" W	Bare Earth	Suffolk County, New York
2019	4507981.049	654411.132	1.298	40°42'29.81108" N	73°10'19.46668" W	Bare Earth	Suffolk County, New York
2020	4518948.144	679918.833	17.537	40°48'06.60967" N	72°52'01.71551" W	Short Grass	Suffolk County, New York
2021	4530843.950	639589.694	12.210	40°55'00.48196" N	73°20'32.42463" W	Bare Earth	Suffolk County, New York
3001	4571937.667	750665.893	1.730	41°15'35.96683" N	72°00'28.35058" W	Urban	Suffolk County, New York
3002	4573691.145	752758.989	4.669	41°16'30.40364" N	71°58'55.90812" W	Urban	Suffolk County, New York

Point No.	Northing	Easting	Elev.	Latitude	Longitude	Surface Desc.	Location
3003	4557213.801	722425.177	14.649	41°08'08.76177" N	72°20'59.86038" W	Urban	Suffolk County, New York
3004	4542960.313	711542.422	8.816	41°00'37.45161" N	72°29'03.82654" W	Urban	Suffolk County, New York
3005	4534650.740	673316.401	43.633	40°56'40.63378" N	72°56'27.55074" W	Urban	Suffolk County, New York
3006	4527110.902	647121.605	50.921	40°52'54.72210" N	73°15'13.75229" W	Urban	Suffolk County, New York
3007	4525974.688	632586.792	9.240	40°52'26.82534" N	73°25'35.43616" W	Urban	Suffolk County, New York
3008	4523924.158	623479.932	27.620	40°51'25.47253" N	73°32'05.85230" W	Urban	Nassau County, New York
3009	4516525.365	610405.490	33.445	40°47'32.30423" N	73°41'28.86682" W	Urban	Nassau County, New York
3010	4506977.694	613349.188	15.740	40°42'21.30477" N	73°39'29.51557" W	Urban	Nassau County, New York
3011	4499596.412	614977.383	4.030	40°38'21.17407" N	73°38'25.01176" W	Urban	Nassau County, New York
3012	4500060.379	647294.113	5.203	40°38'17.74233" N	73°15'29.32307" W	Urban	Suffolk County, New York
3013	4513340.820	679680.140	2.448	40°45'05.07294" N	72°52'17.70008" W	Urban	Suffolk County, New York
3014	4528243.831	674899.875	28.129	40°53'11.77901" N	72°55'26.37178" W	Urban	Suffolk County, New York
3015	4532383.128	726687.845	5.755	40°54'40.16336" N	72°18'30.04941" W	Urban	Suffolk County, New York
3016	4551641.840	757089.582	2.667	41°04'31.48003" N	71°56'23.33461" W	Urban	Suffolk County, New York
3017	4542427.638	727358.025	1.255	41°00'04.87370" N	72°17'48.15797" W	Urban	Suffolk County, New York
3018	4529969.190	710608.955	1.940	40°53'37.42295" N	72°29'59.65343" W	Urban	Suffolk County, New York
3019	4510812.550	653997.899	6.332	40°44'01.87200" N	73°10'34.56352" W	Urban	Suffolk County, New York
3020	4518966.365	679956.033	17.124	40°48'07.17084" N	72°52'00.11010" W	Urban	Suffolk County, New York
3021	4531071.616	638799.980	2.521	40°55'08.34598" N	73°21'05.98881" W	Urban	Suffolk County, New York
4001	4571674.224	750475.566	17.140	41°15'27.64790" N	72°00'36.90808" W	Tall Grass	Suffolk County, New York
4002	4573922.398	752938.261	4.199	41°16'37.69033" N	71°58'47.86740" W	Weeds	Suffolk County, New York
4003	4556877.216	722513.637	14.930	41°07'57.77111" N	72°20'56.50932" W	Tall Grass	Suffolk County, New York
4004	4543982.288	710740.295	8.338	41°01'11.30986" N	72°29'36.87867" W	Weeds	Suffolk County, New York
4005	4534706.774	674194.530	42.139	40°56'41.77757" N	72°55'49.96123" W	Weeds	Suffolk County, New York
4006	4525745.339	646495.641	28.801	40°52'10.86086" N	73°15'41.64530" W	Weeds	Suffolk County, New York
4007	4532293.209	628259.308	12.319	40°55'54.14449" N	73°28'35.55844" W	Tall Grass	Suffolk County, New York
4008	4520583.030	623841.584	74.662	40°49'36.95714" N	73°31'52.80207" W	Weeds	Nassau County, New York
4009	4515788.885	609359.841	8.732	40°47'08.92926" N	73°42'13.93933" W	Weeds	Nassau County, New York
4010	4508100.105	613933.383	22.936	40°42'57.40582" N	73°39'03.89164" W	Weeds	Nassau County, New York
4011	4494362.797	619668.603	2.134	40°35'29.09093" N	73°35'08.92667" W	Weeds	Nassau County, New York

Point No.	Northing	Easting	Elev.	Latitude	Longitude	Surface Desc.	Location
4012	4499147.260	649426.636	4.644	40°37'46.76334" N	73°13'59.35758" W	Weeds	Suffolk County, New York
4013	4512117.312	679602.144	0.764	40°44'25.48197" N	72°52'22.28805" W	Weeds	Suffolk County, New York
4014	4528143.294	674715.037	26.631	40°53'08.66277" N	72°55'34.36693" W	Short Grass	Suffolk County, New York
4015	4532377.754	726652.493	5.736	40°54'40.02454" N	72°18'31.56604" W	Weeds	Suffolk County, New York
4016	4537985.621	725948.457	35.452	40°57'42.38882" N	72°18'54.27113" W	Weeds	Suffolk County, New York
4017	4537652.385	725364.290	37.383	40°57'32.17486" N	72°19'19.67143" W	Weeds	Suffolk County, New York
4018	4525947.906	701356.915	24.664	40°51'35.50563" N	72°36'39.39095" W	Weeds	Suffolk County, New York
4019	4509242.251	654312.688	4.404	40°43'10.75903" N	73°10'22.54219" W	Weeds	Suffolk County, New York
4020	4520730.572	678908.731	22.145	40°49'05.16984" N	72°52'42.95447" W	Tall Grass	Suffolk County, New York
4021	4530891.194	639604.975	12.159	40°55'02.00405" N	73°20'31.73334" W	Tall Grass	Suffolk County, New York
5001	4571955.787	750579.853	0.897	41°15'36.64966" N	72°00'32.01627" W	Brush	Suffolk County, New York
5002	4573964.206	752990.613	4.409	41°16'38.98518" N	71°58'45.55769" W	Brush	Suffolk County, New York
5003	4556907.172	722515.930	15.139	41°07'58.73926" N	72°20'56.37198" W	Brush	Suffolk County, New York
5004	4543982.260	710831.574	6.708	41°01'11.22396" N	72°29'32.97403" W	Brush	Suffolk County, New York
5005	4534664.318	674188.453	41.953	40°56'40.40628" N	72°55'50.26394" W	Brush	Suffolk County, New York
5006	4525744.202	646562.549	30.827	40°52'10.78093" N	73°15'38.78917" W	Brush	Suffolk County, New York
5007	4532276.318	628290.212	14.171	40°55'53.57943" N	73°28'34.25000" W	Brush	Suffolk County, New York
5008	4520596.079	623857.507	74.152	40°49'37.37152" N	73°31'52.11313" W	Brush	Nassau County, New York
5009	4515885.246	609606.029	7.175	40°47'11.93541" N	73°42'03.37692" W	Brush	Nassau County, New York
5010	4494423.781	618417.260	2.053	40°35'31.71646" N	73°36'02.10628" W	Brush	Nassau County, New York
5011	4494430.018	618694.215	2.058	40°35'31.77578" N	73°35'50.32276" W	Brush	Nassau County, New York
5012	4499200.633	649373.699	4.469	40°37'48.52799" N	73°14'01.56433" W	Brush	Suffolk County, New York
5013	4512117.439	679628.157	0.549	40°44'25.46563" N	72°52'21.17952" W	Brush	Suffolk County, New York
5014	4528163.967	674688.505	26.222	40°53'09.35314" N	72°55'35.47902" W	Brush	Suffolk County, New York
5015	4530942.011	726391.450	5.021	40°53'53.77460" N	72°18'44.59727" W	Brush	Suffolk County, New York
5016	4551665.659	757041.735	3.681	41°04'32.30576" N	71°56'25.34636" W	Brush	Suffolk County, New York
5017	4537785.854	725629.619	33.851	40°57'36.23479" N	72°19'08.15834" W	Brush	Suffolk County, New York
5018	4525963.420	701336.846	25.154	40°51'36.02607" N	72°36'40.22939" W	Brush	Suffolk County, New York

Point No.	Northing	Easting	Elev.	Latitude	Longitude	Surface Desc.	Location
5019	4507970.087	654266.139	0.915	40°42'29.55353" N	73°10'25.65255" W	Brush	Suffolk County, New York
5020	4520766.255	678818.926	22.603	40°49'06.39672" N	72°52'46.74862" W	Brush	Suffolk County, New York
5021	4530941.966	639584.871	12.307	40°55'03.66227" N	73°20'32.55134" W	Brush	Suffolk County, New York
6001	4571612.950	750436.969	17.675	41°15'25.70666" N	72°00'38.65499" W	Trees	Suffolk County, New York
6002	4573968.825	752924.333	4.698	41°16'39.20945" N	71°58'48.39595" W	Trees	Suffolk County, New York
6003	4556836.195	722453.254	15.540	41°07'56.50185" N	72°20'59.15001" W	Trees	Suffolk County, New York
6004	4543978.224	710778.965	7.901	41°01'11.14218" N	72°29'35.22946" W	Trees	Suffolk County, New York
6005	4534689.365	674166.442	42.251	40°56'41.23491" N	72°55'51.17940" W	Trees	Suffolk County, New York
6006	4525722.797	646434.009	28.729	40°52'10.16982" N	73°15'44.29617" W	Trees	Suffolk County, New York
6007	4533326.607	628225.347	8.595	40°56'27.66491" N	73°28'36.24045" W	Trees	Suffolk County, New York
6008	4520575.671	623867.780	73.919	40°49'36.70433" N	73°31'51.68930" W	Trees	Nassau County, New York
6009	4515902.656	609607.000	7.691	40°47'12.49943" N	73°42'03.32448" W	Trees	Nassau County, New York
6010	4514083.232	679535.687	4.178	40°45'29.24704" N	72°52'23.08902" W	Trees	Suffolk County, New York
6011	4514085.294	679550.255	4.125	40°45'29.30242" N	72°52'22.46601" W	Trees	Suffolk County, New York
6012	4514108.731	679542.517	4.238	40°45'30.06808" N	72°52'22.77157" W	Trees	Suffolk County, New York
6013	4514109.209	679526.050	4.159	40°45'30.09649" N	72°52'23.47292" W	Trees	Suffolk County, New York
6014	4528169.232	674717.439	27.901	40°53'09.50157" N	72°55'34.23810" W	Trees	Suffolk County, New York
6015	4507928.806	654519.508	1.199	40°42'28.04451" N	73°10'14.89661" W	Trees	Suffolk County, New York
6016	4551570.911	757102.043	2.678	41°04'29.16897" N	71°56'22.90798" W	Trees	Suffolk County, New York
6017	4538016.131	726002.249	35.033	40°57'43.32357" N	72°18'51.93231" W	Trees	Suffolk County, New York
6018	4525970.625	701324.229	25.281	40°51'36.27071" N	72°36'40.75947" W	Trees	Suffolk County, New York
6019	4507998.319	654249.573	0.749	40°42'30.47985" N	73°10'26.33320" W	Trees	Suffolk County, New York
6020	4520786.958	678897.719	22.004	40°49'07.00587" N	72°52'43.36597" W	Trees	Suffolk County, New York
6021	4530855.809	639631.624	12.932	40°55'00.84061" N	73°20'30.62318" W	Trees	Suffolk County, New York

LIDAR Control Points

Point No.	Northing	Easting	Elev.	Latitude	Longitude	Surface Desc.	Location
1001	4571654.607	750454.994	16.535	41°15'27.03555" N	72°00'37.81990" W	LCP	Suffolk County, New York
1002	4573960.771	752963.008	4.719	41°16'38.90506" N	71°58'46.74778" W	LCP	Suffolk County, New York

Point No.	Northing	Easting	Elev.	Latitude	Longitude	Surface Desc.	Location
1003	4557230.826	722392.131	14.120	41°08'09.34587" N	72°21'01.25410" W	LCP	Suffolk County, New York
1004	4543905.217	710764.207	8.757	41°01'08.79062" N	72°29'35.95052" W	LCP	Suffolk County, New York
1005	4534575.847	673223.932	44.042	40°56'38.27715" N	72°56'31.57842" W	LCP	Suffolk County, New York
1006	4526095.984	646909.429	36.181	40°52'21.96037" N	73°15'23.67764" W	LCP	Suffolk County, New York
1007	4533379.212	628196.665	5.668	40°56'29.38647" N	73°28'37.42751" W	LCP	Suffolk County, New York
1008	4524778.015	623754.666	15.628	40°51'53.00518" N	73°31'53.50987" W	LCP	Nassau County, New York
1009	4515933.142	609487.995	9.462	40°47'13.54500" N	73°42'08.38166" W	LCP	Nassau County, New York
1010	4508125.027	613899.457	23.126	40°42'58.23074" N	73°39'05.32095" W	LCP	Nassau County, New York
1011	4499828.883	615619.228	3.932	40°38'28.38874" N	73°37'57.53977" W	LCP	Nassau County, New York
1012	4499127.621	649272.901	4.797	40°37'46.22679" N	73°14'05.91542" W	LCP	Suffolk County, New York
1013	4512184.562	679608.953	1.188	40°44'27.65609" N	72°52'21.92847" W	LCP	Suffolk County, New York
1014	4526929.390	675357.018	34.882	40°52'28.82745" N	72°55'08.18487" W	LCP	Suffolk County, New York
1015	4530961.437	726410.427	2.465	40°53'54.38500" N	72°18'43.76157" W	LCP	Suffolk County, New York
1016	4551252.897	756918.260	2.084	41°04'19.07969" N	71°56'31.25022" W	LCP	Suffolk County, New York
1017	4542280.336	727361.039	0.668	41°00'00.09904" N	72°17'48.22419" W	LCP	Suffolk County, New York
1018	4529927.191	711126.027	14.999	40°53'35.58279" N	72°29'37.62792" W	LCP	Suffolk County, New York
1019	4507873.391	654434.794	1.157	40°42'26.30540" N	73°10'18.55421" W	LCP	Suffolk County, New York
1020	4520663.258	678889.297	21.743	40°49'03.00355" N	72°52'43.85302" W	LCP	Suffolk County, New York
1021	4530836.203	639534.194	11.910	40°55'00.26493" N	73°20'34.80262" W	LCP	Suffolk County, New York

Survey Control Points

Point No.	Northing	Easting	Elev.	Latitude	Longitude	Surface Desc.	Location
20000	4571658.152	750520.550	16.771	41°15'27.07724" N	72°00'35.00137" W	Nail Set	Suffolk County, New York
20001	4515998.001	609447.995	10.070	40°47'15.66707" N	73°42'10.04703" W	Nail Set	Nassau County, New York
31004	4537996.803	725985.505	35.108	40°57'42.71415" N	72°18'52.67324" W	Nail Set	Suffolk County, New York
31005	4514020.743	679525.150	4.034	40°45'27.23016" N	72°52'23.60268" W	Nail Set	Suffolk County, New York
31006	4514068.390	679515.916	4.222	40°45'28.78156" N	72°52'23.94701" W	Nail Set	Suffolk County, New York

NGS Stations

Station Name	Northing	Easting	Elev.	Latitude	Longitude	Location
11 E 12 N	4509530.666	620426.818	25.805	40°43'40.46037" N	73°34'26.21561" W	Nassau County, New York
Q 334	4535312.160	684443.762	30.985	40°56'53.29912" N	72°48'31.26561" W	Suffolk County, New York
U 325	4558021.624	725176.959	2.234	41°08'32.19881" N	72°19'00.88833" W	Suffolk County, New York

KeyNetGPS Stations

Station Name	Northing	Easting	Elev.	Latitude	Longitude	Location
KP18	4590260.404	780218.287	54.170	41°24'54.18994" N	71°38'49.97523" W	Washington County, Rhode Island
MTG1	4596516.429	743410.683	96.126	41°28'59.94792" N	72°05'04.22169" W	New London County, Connecticut
NYCI	4513746.728	652125.427	17.195	40°45'38.23686" N	73°11'51.78726" W	Suffolk County, New York
NYQN	4508397.044	607255.512	31.182	40°43'10.26182" N	73°43'48.26660" W	Queens County, New York
NYRH	4532765.085	692482.214	23.276	40°55'24.08866" N	72°42'50.56071" W	Suffolk County, New York

SECTION 3: GROUND CONTROL STATION INFORMATION SHEETS

This section contains the station information sheets for each of the new quality control check points to support the Long Island, New York Sandy Lidar Project.

Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2001	
Date of Survey 4/17/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 41°15'26.14707" N	Longitude 72°00'40.02370" W	Ellipsoid Ht. -19.123 (Meters)	Geoid Ht. -30.802 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000375146	Northing (UTM 18) 4571625.437 (Meters)	Easting (UTM 18) 750404.645 (Meters)	Elevation 11.679 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2002	
Date of Survey 4/17/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 41°16'38.75042" N	Longitude 71°58'46.34828" W	Ellipsoid Ht. -25.816 (Meters)	Geoid Ht. -30.763 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000392118	Northing (UTM 18) 4573956.325 (Meters)	Easting (UTM 18) 752972.470 (Meters)	Elevation 4.947 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2003	
Date of Survey 4/16/2014				Ground Type Bare Earth	
Established by WOOLPERT, INC.	Latitude 41°08'09.07481" N	Longitude 72°21'00.22861" W	Ellipsoid Ht. -16.603 (Meters)	Geoid Ht. -30.962 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000211723	Northing (UTM 18) 4557223.194 (Meters)	Easting (UTM 18) 722416.297 (Meters)	Elevation 14.359 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 2004			
Date of Survey 4/16/2014		Ground Type Bare Earth			
Established by WOOLPERT, INC.	Latitude 41°01'07.43910" N	Longitude 72°29'34.85123" W	Ellipsoid Ht. -22.353 (Meters)	Geoid Ht. -31.201 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.0001506	Northing (UTM 18) 4543864.274 (Meters)	Easting (UTM 18) 710791.081 (Meters)	Elevation 8.847 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 2005			
Date of Survey 4/19/2014					
Established by WOOLPERT, INC.	Latitude 40°56'36.87845" N	Longitude 72°56'27.04111" W	Ellipsoid Ht. 13.126 (Meters)	Geoid Ht. -30.797 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999967823	Northing (UTM 18) 4534535.212 (Meters)	Easting (UTM 18) 673331.046 (Meters)	Elevation 43.923 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 2006			
Date of Survey 4/20/2014					
Established by WOOLPERT, INC.	Latitude 40°52'22.53909" N	Longitude 73°15'23.18007" W	Ellipsoid Ht. 6.380 (Meters)	Geoid Ht. -30.622 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999864732	Northing (UTM 18) 4526114.062 (Meters)	Easting (UTM 18) 646920.721 (Meters)	Elevation 37.002 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 2007			
Date of Survey 4/21/2014					
Established by WOOLPERT, INC.	Latitude 40°56'30.89753" N	Longitude 73°28'38.89442" W	Ellipsoid Ht. -28.780 (Meters)	Geoid Ht. -30.594 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999806696	Northing (UTM 18) 4533425.211 (Meters)	Easting (UTM 18) 628161.552 (Meters)	Elevation 1.814 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York		Station Description Lidar QAQC Point # 2008			
Date of Survey 4/21/2014		Ground Type Short Grass			
Established by WOOLPERT, INC.	Latitude 40°51'51.55533" N	Longitude 73°31'52.65256" W	Ellipsoid Ht. -13.572 (Meters)	Geoid Ht. -30.883 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999790714	Northing (UTM 18) 4524733.643 (Meters)	Easting (UTM 18) 623775.486 (Meters)	Elevation 17.311 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 2009	
Date of Survey 4/22/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 40°47'22.86355" N	Longitude 73°42'16.75619" W	Ellipsoid Ht. -24.308 (Meters)	Geoid Ht. -31.316 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999750827	Northing (UTM 18) 4516217.587 (Meters)	Easting (UTM 18) 609287.473 (Meters)	Elevation 7.008 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 2010	
Date of Survey 4/22/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 40°42'58.36408" N	Longitude 73°39'04.83854" W	Ellipsoid Ht. -8.362 (Meters)	Geoid Ht. -31.550 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999761037	Northing (UTM 18) 4508129.312 (Meters)	Easting (UTM 18) 613910.712 (Meters)	Elevation 23.188 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 2011	
Date of Survey 4/21/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 40°38'20.25674" N	Longitude 73°37'49.19847" W	Ellipsoid Ht. -28.121 (Meters)	Geoid Ht. -31.757 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999769531	Northing (UTM 18) 4499581.178 (Meters)	Easting (UTM 18) 615819.059 (Meters)	Elevation 3.637 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2012	
Date of Survey 4/21/2014				Ground Type Bare Earth	
Established by WOOLPERT, INC.	Latitude 40°37'47.10905" N	Longitude 73°14'02.64572" W	Ellipsoid Ht. -26.827 (Meters)	Geoid Ht. -31.520 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999878805	Northing (UTM 18) 4499156.369 (Meters)	Easting (UTM 18) 649349.172 (Meters)	Elevation 4.694 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2013	
Date of Survey 4/19/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 40°44'25.79357" N	Longitude 73°14'02.64572" W	Ellipsoid Ht. -30.858 (Meters)	Geoid Ht. -31.681 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000002035	Northing (UTM 18) 4512127.196 (Meters)	Easting (UTM 18) 679613.262 (Meters)	Elevation 0.824 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2014	
Date of Survey 4/18/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 40°53'10.98323" N	Longitude 72°55'27.81979" W	Ellipsoid Ht. -2.661 (Meters)	Geoid Ht. -31.039 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999976884	Northing (UTM 18) 4528218.486 (Meters)	Easting (UTM 18) 674866.569 (Meters)	Elevation 28.378 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2015	
Date of Survey 4/17/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 40°54'39.60580" N	Longitude 72°18'28.92621" W	Ellipsoid Ht. -25.815 (Meters)	Geoid Ht. -31.496 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000236983	Northing (UTM 18) 4532366.742 (Meters)	Easting (UTM 18) 726714.653 (Meters)	Elevation 5.681 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC

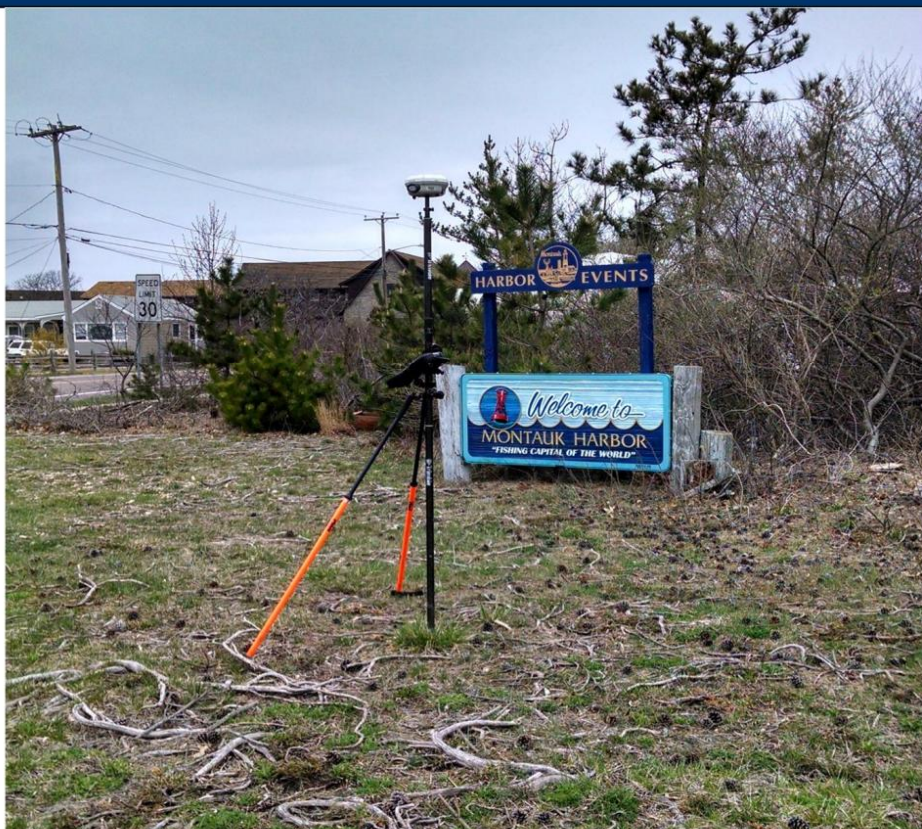


**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2016	
Date of Survey 4/18/2014				Ground Type Bare Earth	
Established by WOOLPERT, INC.	Latitude 41°04'19.62878" N	Longitude 71°56'30.90555" W	Ellipsoid Ht. -28.947 (Meters)	Geoid Ht. -31.057 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000417489	Northing (UTM 18) 4551270.114 (Meters)	Easting (UTM 18) 756925.711 (Meters)	Elevation 2.111 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2017	
Date of Survey 4/18/2014				Ground Type Bare Earth	
Established by WOOLPERT, INC.	Latitude 40°59'59.34582" N	Longitude 72°17'48.86098" W	Ellipsoid Ht. -30.681 (Meters)	Geoid Ht. -31.330 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000241269	Northing (UTM 18) 4542256.645 (Meters)	Easting (UTM 18) 727346.880 (Meters)	Elevation 0.649 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2018	
Date of Survey 4/17/2014				Ground Type Bare Earth	
Established by WOOLPERT, INC.	Latitude 40°53'35.33073" N	Longitude 72°29'39.11306" W	Ellipsoid Ht. -17.757 (Meters)	Geoid Ht. -31.524 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000151458	Northing (UTM 18) 4529918.422 (Meters)	Easting (UTM 18) 711091.494 (Meters)	Elevation 13.767 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2019	
Date of Survey 4/20/2014				Ground Type Bare Earth	
Established by WOOLPERT, INC.	Latitude 40°42'29.81108" N	Longitude 73°10'19.46668" W	Ellipsoid Ht. -30.010 (Meters)	Geoid Ht. -31.309 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999898233	Northing (UTM 18) 4507981.049 (Meters)	Easting (UTM 18) 654411.132 (Meters)	Elevation 1.298 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2020	
Date of Survey 4/19/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 40°48'06.60967" N	Longitude 72°52'01.71551" W	Ellipsoid Ht. -13.927 (Meters)	Geoid Ht. -31.465 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000000732	Northing (UTM 18) 4518948.144 (Meters)	Easting (UTM 18) 679918.833 (Meters)	Elevation 17.537 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 2021	
Date of Survey 4/20/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 40°55'00.48196" N	Longitude 73°20'32.42463" W	Ellipsoid Ht. -18.308 (Meters)	Geoid Ht. -30.518 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999842732	Northing (UTM 18) 4530843.950 (Meters)	Easting (UTM 18) 639589.694 (Meters)	Elevation 12.210 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 3001			
Date of Survey 4/17/2014					
Established by WOOLPERT, INC.	Latitude 41°15'35.96683" N	Longitude 72°00'28.35058" W	Ellipsoid Ht. -29.067 (Meters)	Geoid Ht. -30.797 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000378316	Northing (UTM 18) 4571937.667 (Meters)	Easting (UTM 18) 750665.893 (Meters)	Elevation 1.730 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3002	
Date of Survey 4/17/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 41°16'30.40364" N	Longitude 71°58'55.90812" W	Ellipsoid Ht. -26.099 (Meters)	Geoid Ht. -30.768 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000390832	Northing (UTM 18) 4573691.145 (Meters)	Easting (UTM 18) 752758.989 (Meters)	Elevation 4.669 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3003	
Date of Survey 4/16/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 41°08'08.76177" N	Longitude 72°20'59.86038" W	Ellipsoid Ht. -16.313 (Meters)	Geoid Ht. -30.962 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000211726	Northing (UTM 18) 4557213.801 (Meters)	Easting (UTM 18) 722425.177 (Meters)	Elevation 14.649 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3004	
Date of Survey 4/16/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 41°00'37.45161" N	Longitude 72°29'03.82654" W	Ellipsoid Ht. -22.417 (Meters)	Geoid Ht. -31.233 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.00015452	Northing (UTM 18) 4542960.313 (Meters)	Easting (UTM 18) 711542.422 (Meters)	Elevation 8.816 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3005	
Date of Survey 4/19/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°56'40.63378" N	Longitude 72°56'27.55074" W	Ellipsoid Ht. 12.840 (Meters)	Geoid Ht. -30.793 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999967805	Northing (UTM 18) 4534650.740 (Meters)	Easting (UTM 18) 673316.401 (Meters)	Elevation 43.633 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3006	
Date of Survey 4/20/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°52'54.72210" N	Longitude 73°15'13.75229" W	Ellipsoid Ht. 20.325 (Meters)	Geoid Ht. -30.596 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999863276	Northing (UTM 18) 4527110.902 (Meters)	Easting (UTM 18) 647121.605 (Meters)	Elevation 50.921 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3007	
Date of Survey 4/20/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°52'26.82534" N	Longitude 73°25'35.43616" W	Ellipsoid Ht. -21.443 (Meters)	Geoid Ht. -30.683 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999819757	Northing (UTM 18) 4525974.688 (Meters)	Easting (UTM 18) 632586.792 (Meters)	Elevation 9.240 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 3008	
Date of Survey 4/21/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°51'25.47253" N	Longitude 73°32'05.85230" W	Ellipsoid Ht. -3.287 (Meters)	Geoid Ht. -30.908 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999788205	Northing (UTM 18) 4523924.158 (Meters)	Easting (UTM 18) 623479.932 (Meters)	Elevation 27.620 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 3009	
Date of Survey 4/22/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°47'32.30423" N	Longitude 73°41'28.86682" W	Ellipsoid Ht. 2.145 (Meters)	Geoid Ht. -31.300 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99974971	Northing (UTM 18) 4516525.365 (Meters)	Easting (UTM 18) 610405.490 (Meters)	Elevation 33.445 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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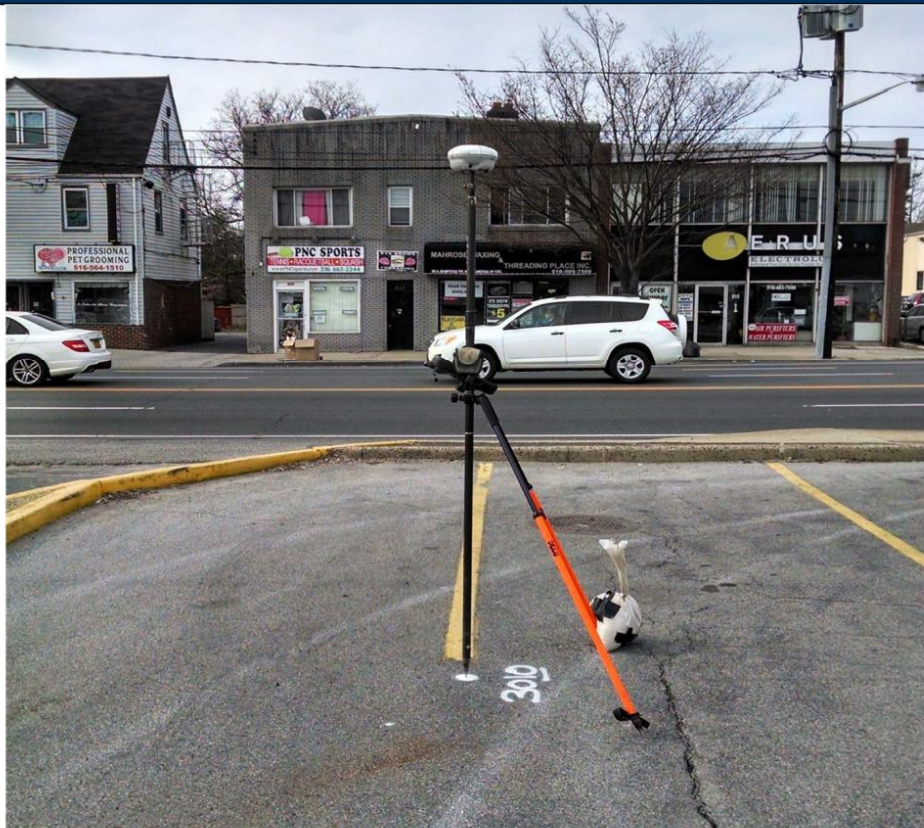


**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York		Station Description Lidar QAQC Point # 3010			
Date of Survey 4/22/2014		Ground Type Urban			
Established by WOOLPERT, INC.	Latitude 40°42'21.30477" N	Longitude 73°39'29.51557" W	Ellipsoid Ht. -15.857 (Meters)	Geoid Ht. -31.597 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99976064	Northing (UTM 18) 4506977.694 (Meters)	Easting (UTM 18) 613349.188 (Meters)	Elevation 15.740 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 3011	
Date of Survey 4/21/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°38'21.17407" N	Longitude 73°38'25.01176" W	Ellipsoid Ht. -27.748 (Meters)	Geoid Ht. -31.779 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999767081	Northing (UTM 18) 4499596.412 (Meters)	Easting (UTM 18) 614977.383 (Meters)	Elevation 4.030 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3012	
Date of Survey 4/20/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°38'17.74233" N	Longitude 73°15'29.32307" W	Ellipsoid Ht. -26.264 (Meters)	Geoid Ht. -31.467 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99987121	Northing (UTM 18) 4500060.379 (Meters)	Easting (UTM 18) 647294.113 (Meters)	Elevation 5.203 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3013	
Date of Survey 4/19/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°45'05.07294" N	Longitude 72°52'17.70008" W	Ellipsoid Ht. -29.195 (Meters)	Geoid Ht. -31.643 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.00000207	Northing (UTM 18) 4513340.820 (Meters)	Easting (UTM 18) 679680.140 (Meters)	Elevation 2.448 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 3014			
Date of Survey 4/18/2014					
Established by WOOLPERT, INC.	Latitude 40°53'11.77901" N	Longitude 72°55'26.37178" W	Ellipsoid Ht. -2.910 (Meters)	Geoid Ht. -31.039 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999977067	Northing (UTM 18) 4528243.831 (Meters)	Easting (UTM 18) 674899.875 (Meters)	Elevation 28.129 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3015	
Date of Survey 4/17/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°54'40.16336" N	Longitude 72°18'30.04941" W	Ellipsoid Ht. -25.742 (Meters)	Geoid Ht. -31.496 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000236822	Northing (UTM 18) 4532383.128 (Meters)	Easting (UTM 18) 726687.845 (Meters)	Elevation 5.755 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3016	
Date of Survey 4/18/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 41°04'31.48003" N	Longitude 71°56'23.33461" W	Ellipsoid Ht. -28.383 (Meters)	Geoid Ht. -31.051 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000418439	Northing (UTM 18) 4551641.840 (Meters)	Easting (UTM 18) 757089.582 (Meters)	Elevation 2.667 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3017	
Date of Survey 4/18/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 41°00'04.87370" N	Longitude 72°17'48.15797" W	Ellipsoid Ht. -30.072 (Meters)	Geoid Ht. -31.327 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000241236	Northing (UTM 18) 4542427.638 (Meters)	Easting (UTM 18) 727358.025 (Meters)	Elevation 1.255 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3018	
Date of Survey 4/17/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°53'37.42295" N	Longitude 72°29'59.65343" W	Ellipsoid Ht. -29.580 (Meters)	Geoid Ht. -31.520 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000150802	Northing (UTM 18) 4529969.190 (Meters)	Easting (UTM 18) 710608.955 (Meters)	Elevation 1.940 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3019	
Date of Survey 4/20/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°44'01.87200" N	Longitude 73°10'34.56352" W	Ellipsoid Ht. -24.870 (Meters)	Geoid Ht. -31.202 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999895857	Northing (UTM 18) 4510812.550 (Meters)	Easting (UTM 18) 653997.899 (Meters)	Elevation 6.332 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3020	
Date of Survey 4/19/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°48'07.17084" N	Longitude 72°52'00.11010" W	Ellipsoid Ht. -14.341 (Meters)	Geoid Ht. -31.465 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000000961	Northing (UTM 18) 4518966.365 (Meters)	Easting (UTM 18) 679956.033 (Meters)	Elevation 17.124 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 3021	
Date of Survey 4/20/2014				Ground Type Urban	
Established by WOOLPERT, INC.	Latitude 40°55'08.34598" N	Longitude 73°21'05.98881" W	Ellipsoid Ht. -27.998 (Meters)	Geoid Ht. -30.519 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999841542	Northing (UTM 18) 4531071.616 (Meters)	Easting (UTM 18) 638799.980 (Meters)	Elevation 2.521 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4001	
Date of Survey 4/17/2014				Ground Type Tall Grass	
Established by WOOLPERT, INC.	Latitude 41°15'27.64790" N	Longitude 72°00'36.90808" W	Ellipsoid Ht. -13.662 (Meters)	Geoid Ht. -30.802 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000374728	Northing (UTM 18) 4571674.224 (Meters)	Easting (UTM 18) 750475.566 (Meters)	Elevation 17.140 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4002	
Date of Survey 4/17/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 41°16'37.69033" N	Longitude 71°58'47.86740" W	Ellipsoid Ht. -26.565 (Meters)	Geoid Ht. -30.764 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000392022	Northing (UTM 18) 4573922.398 (Meters)	Easting (UTM 18) 752938.261 (Meters)	Elevation 4.199 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4003	
Date of Survey 4/16/2014				Ground Type Tall Grass	
Established by WOOLPERT, INC.	Latitude 41°07'57.77111" N	Longitude 72°20'56.50932" W	Ellipsoid Ht. -16.040 (Meters)	Geoid Ht. -30.971 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000212169	Northing (UTM 18) 4556877.216 (Meters)	Easting (UTM 18) 722513.637 (Meters)	Elevation 14.930 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4004	
Date of Survey 4/16/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 41°01'11.30986" N	Longitude 72°29'36.87867" W	Ellipsoid Ht. -22.859 (Meters)	Geoid Ht. -31.197 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000150415	Northing (UTM 18) 4543982.288 (Meters)	Easting (UTM 18) 710740.295 (Meters)	Elevation 8.338 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4005	
Date of Survey 4/19/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°56'41.77757" N	Longitude 72°55'49.96123" W	Ellipsoid Ht. 11.330 (Meters)	Geoid Ht. -30.809 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.9999718	Northing (UTM 18) 4534706.774 (Meters)	Easting (UTM 18) 674194.530 (Meters)	Elevation 42.139 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4006	
Date of Survey 4/20/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°52'10.86086" N	Longitude 73°15'41.64530" W	Ellipsoid Ht. -1.828 (Meters)	Geoid Ht. -30.629 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999864481	Northing (UTM 18) 4525745.339 (Meters)	Easting (UTM 18) 646495.641 (Meters)	Elevation 28.801 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4007	
Date of Survey 4/21/2014				Ground Type Tall Grass	
Established by WOOLPERT, INC.	Latitude 40°55'54.14449" N	Longitude 73°28'35.55844" W	Ellipsoid Ht. -18.297 (Meters)	Geoid Ht. -30.616 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999805364	Northing (UTM 18) 4532293.209 (Meters)	Easting (UTM 18) 628259.308 (Meters)	Elevation 12.319 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 4008	
Date of Survey 4/21/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°49'36.95714" N	Longitude 73°31'52.80207" W	Ellipsoid Ht. 43.679 (Meters)	Geoid Ht. -30.983 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999781956	Northing (UTM 18) 4520583.030 (Meters)	Easting (UTM 18) 623841.584 (Meters)	Elevation 74.662 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 4009	
Date of Survey 4/22/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°47'08.92926" N	Longitude 73°42'13.93933" W	Ellipsoid Ht. -22.595 (Meters)	Geoid Ht. -31.327 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999750753	Northing (UTM 18) 4515788.885 (Meters)	Easting (UTM 18) 609359.841 (Meters)	Elevation 8.732 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 4010	
Date of Survey 4/22/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°42'57.40582" N	Longitude 73°39'03.89164" W	Ellipsoid Ht. -8.614 (Meters)	Geoid Ht. -31.551 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99976114	Northing (UTM 18) 4508100.105 (Meters)	Easting (UTM 18) 613933.383 (Meters)	Elevation 22.936 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 4011	
Date of Survey 4/21/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°35'29.09093" N	Longitude 73°35'08.92667" W	Ellipsoid Ht. -29.636 (Meters)	Geoid Ht. -31.770 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999780931	Northing (UTM 18) 4494362.797 (Meters)	Easting (UTM 18) 619668.603 (Meters)	Elevation 2.134 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4012	
Date of Survey 4/21/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°37'46.76334" N	Longitude 73°13'59.35758" W	Ellipsoid Ht. -26.878 (Meters)	Geoid Ht. -31.522 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999879098	Northing (UTM 18) 4499147.260 (Meters)	Easting (UTM 18) 649426.636 (Meters)	Elevation 4.644 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4013	
Date of Survey 4/19/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°44'25.48197" N	Longitude 72°52'22.28805" W	Ellipsoid Ht. -30.918 (Meters)	Geoid Ht. -31.681 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000001995	Northing (UTM 18) 4512117.312 (Meters)	Easting (UTM 18) 679602.144 (Meters)	Elevation 0.764 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4014	
Date of Survey 4/18/2014				Ground Type Short Grass	
Established by WOOLPERT, INC.	Latitude 40°53'08.66277" N	Longitude 72°55'34.36693" W	Ellipsoid Ht. -4.408 (Meters)	Geoid Ht. -31.039 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999976506	Northing (UTM 18) 4528143.294 (Meters)	Easting (UTM 18) 674715.037 (Meters)	Elevation 26.631 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4015	
Date of Survey 4/17/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°54'40.02454" N	Longitude 72°18'31.56604" W	Ellipsoid Ht. -25.760 (Meters)	Geoid Ht. -31.496 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000236628	Northing (UTM 18) 4532377.754 (Meters)	Easting (UTM 18) 726652.493 (Meters)	Elevation 5.736 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4016	
Date of Survey 4/17/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°57'42.38882" N	Longitude 72°18'54.27113" W	Ellipsoid Ht. 4.057 (Meters)	Geoid Ht. -31.395 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000228025	Northing (UTM 18) 4537985.621 (Meters)	Easting (UTM 18) 725948.457 (Meters)	Elevation 35.452 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4017	
Date of Survey 4/17/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°57'32.17486" N	Longitude 72°19'19.67143" W	Ellipsoid Ht. 5.983 (Meters)	Geoid Ht. -31.400 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000224475	Northing (UTM 18) 4537652.385 (Meters)	Easting (UTM 18) 725364.290 (Meters)	Elevation 37.383 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 4018			
Date of Survey 4/19/2014					
Established by WOOLPERT, INC.	Latitude 40°51'35.50563" N	Longitude 72°36'39.39095" W	Ellipsoid Ht. -6.877 (Meters)	Geoid Ht. -31.541 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000100299	Northing (UTM 18) 4525947.906 (Meters)	Easting (UTM 18) 701356.915 (Meters)	Elevation 24.664 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4019	
Date of Survey 4/20/2014				Ground Type Weeds	
Established by WOOLPERT, INC.	Latitude 40°43'10.75903" N	Longitude 73°10'22.54219" W	Ellipsoid Ht. -26.859 (Meters)	Geoid Ht. -31.263 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999897364	Northing (UTM 18) 4509242.251 (Meters)	Easting (UTM 18) 654312.688 (Meters)	Elevation 4.404 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 4020			
Date of Survey 4/19/2014					
Established by WOOLPERT, INC.	Latitude 40°49'05.16984" N	Longitude 72°52'42.95447" W	Ellipsoid Ht. -9.240 (Meters)	Geoid Ht. -31.385 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999995532	Northing (UTM 18) 4520730.572 (Meters)	Easting (UTM 18) 678908.731 (Meters)	Elevation 22.145 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 4021	
Date of Survey 4/20/2014				Ground Type Tall Grass	
Established by WOOLPERT, INC.	Latitude 40°55'02.00405" N	Longitude 73°20'31.73334" W	Ellipsoid Ht. -18.358 (Meters)	Geoid Ht. -30.517 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999842792	Northing (UTM 18) 4530891.194 (Meters)	Easting (UTM 18) 639604.975 (Meters)	Elevation 12.159 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5001	
Date of Survey 4/17/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 41°15'36.64966" N	Longitude 72°00'32.01627" W	Ellipsoid Ht. -29.900 (Meters)	Geoid Ht. -30.797 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000377915	Northing (UTM 18) 4571955.787 (Meters)	Easting (UTM 18) 750579.853 (Meters)	Elevation 0.897 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5002	
Date of Survey 4/17/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 41°16'38.98518" N	Longitude 71°58'45.55769" W	Ellipsoid Ht. -26.355 (Meters)	Geoid Ht. -30.763 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000392315	Northing (UTM 18) 4573964.206 (Meters)	Easting (UTM 18) 752990.613 (Meters)	Elevation 4.409 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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USGS/NGTOC

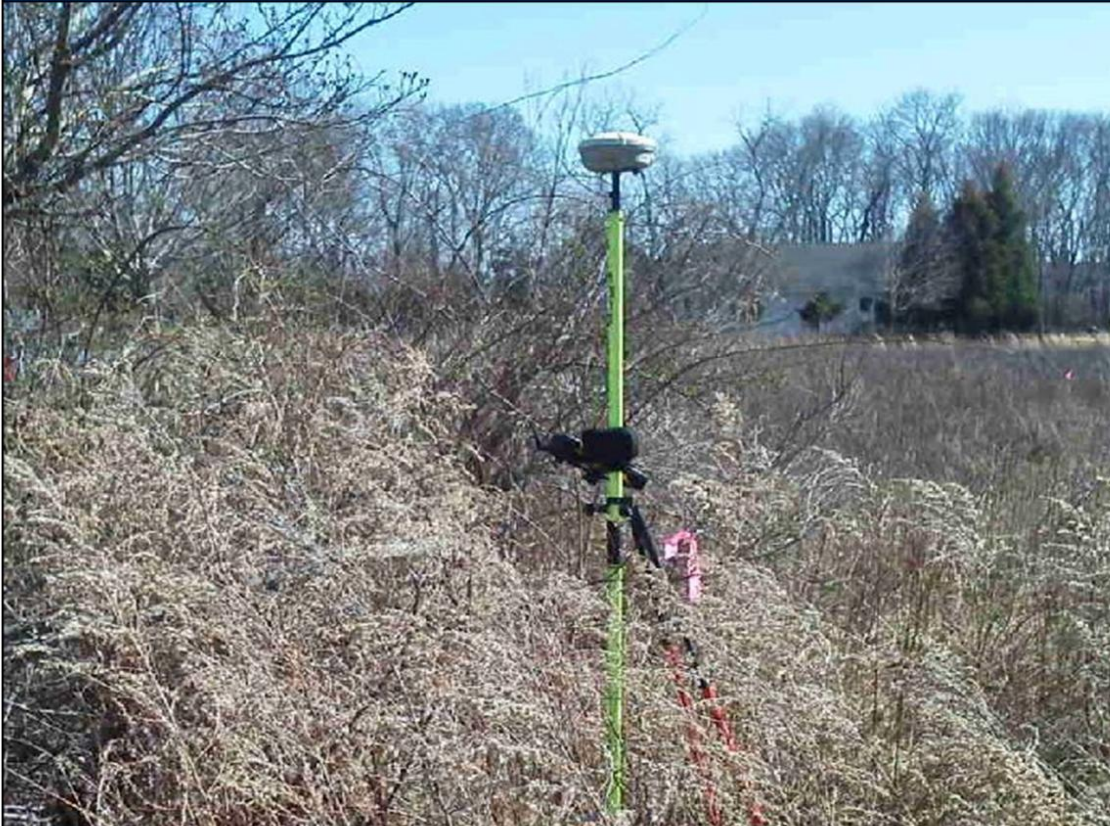


**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5003	
Date of Survey 4/16/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 41°07'58.73926" N	Longitude 72°20'56.37198" W	Ellipsoid Ht. -15.831 (Meters)	Geoid Ht. -30.970 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000212149	Northing (UTM 18) 4556907.172 (Meters)	Easting (UTM 18) 722515.930 (Meters)	Elevation 15.139 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5004	
Date of Survey 4/16/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 41°01'11.22396" N	Longitude 72°29'32.97403" W	Ellipsoid Ht. -24.490 (Meters)	Geoid Ht. -31.198 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000151144	Northing (UTM 18) 4543982.260 (Meters)	Easting (UTM 18) 710831.574 (Meters)	Elevation 6.708 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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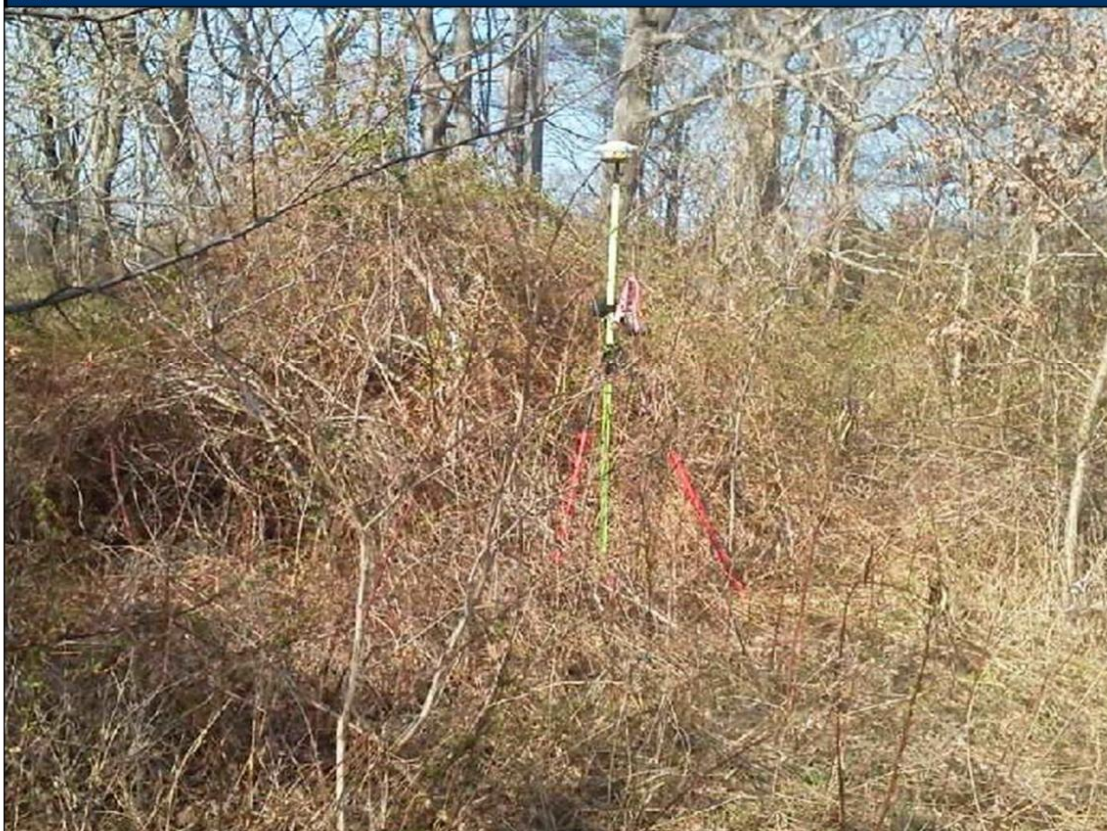


**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5005	
Date of Survey 4/19/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°56'40.40628" N	Longitude 72°55'50.26394" W	Ellipsoid Ht. 11.142 (Meters)	Geoid Ht. -30.810 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999971803	Northing (UTM 18) 4534664.318 (Meters)	Easting (UTM 18) 674188.453 (Meters)	Elevation 41.953 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5006	
Date of Survey 4/20/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°52'10.78093" N	Longitude 73°15'38.78917" W	Ellipsoid Ht. 0.198 (Meters)	Geoid Ht. -30.629 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999864406	Northing (UTM 18) 4525744.202 (Meters)	Easting (UTM 18) 646562.549 (Meters)	Elevation 30.827 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5007	
Date of Survey 4/21/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°55'53.57943" N	Longitude 73°28'34.25000" W	Ellipsoid Ht. -16.445 (Meters)	Geoid Ht. -30.616 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999805172	Northing (UTM 18) 4532276.318 (Meters)	Easting (UTM 18) 628290.212 (Meters)	Elevation 14.171 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 5008	
Date of Survey 4/21/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°49'37.37152" N	Longitude 73°31'52.11313" W	Ellipsoid Ht. 43.170 (Meters)	Geoid Ht. -30.983 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999782084	Northing (UTM 18) 4520596.079 (Meters)	Easting (UTM 18) 623857.507 (Meters)	Elevation 74.152 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 5009	
Date of Survey 4/22/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°47'11.93541" N	Longitude 73°42'03.37692" W	Ellipsoid Ht. -24.148 (Meters)	Geoid Ht. -31.323 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99975166	Northing (UTM 18) 4515885.246 (Meters)	Easting (UTM 18) 609606.029 (Meters)	Elevation 7.175 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 5010	
Date of Survey 4/21/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°35'31.71646" N	Longitude 73°36'02.10628" W	Ellipsoid Ht. -29.747 (Meters)	Geoid Ht. -31.800 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99977728	Northing (UTM 18) 4494423.781 (Meters)	Easting (UTM 18) 618417.260 (Meters)	Elevation 2.053 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 5011	
Date of Survey 4/21/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°35'31.77578" N	Longitude 73°35'50.32276" W	Ellipsoid Ht. -29.735 (Meters)	Geoid Ht. -31.793 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999778087	Northing (UTM 18) 4494430.018 (Meters)	Easting (UTM 18) 618694.215 (Meters)	Elevation 2.058 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5012	
Date of Survey 4/21/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°37'48.52799" N	Longitude 73°14'01.56433" W	Ellipsoid Ht. -27.051 (Meters)	Geoid Ht. -31.519 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99987893	Northing (UTM 18) 4499200.633 (Meters)	Easting (UTM 18) 649373.699 (Meters)	Elevation 4.469 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5013	
Date of Survey 4/19/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°44'25.46563" N	Longitude 72°52'21.17952" W	Ellipsoid Ht. -31.133 (Meters)	Geoid Ht. -31.682 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000002144	Northing (UTM 18) 4512117.439 (Meters)	Easting (UTM 18) 679628.157 (Meters)	Elevation 0.549 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5014	
Date of Survey 4/18/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°53'09.35314" N	Longitude 72°55'35.47902" W	Ellipsoid Ht. -4.816 (Meters)	Geoid Ht. -31.038 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999976455	Northing (UTM 18) 4528163.967 (Meters)	Easting (UTM 18) 674688.505 (Meters)	Elevation 26.222 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5015	
Date of Survey 4/17/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°53'53.77460" N	Longitude 72°18'44.59727" W	Ellipsoid Ht. -26.502 (Meters)	Geoid Ht. -31.523 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000235289	Northing (UTM 18) 4530942.011 (Meters)	Easting (UTM 18) 726391.450 (Meters)	Elevation 5.021 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5016	
Date of Survey 4/18/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 41°04'32.30576" N	Longitude 71°56'25.34636" W	Ellipsoid Ht. -27.369 (Meters)	Geoid Ht. -31.051 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000417977	Northing (UTM 18) 4551665.659 (Meters)	Easting (UTM 18) 757041.735 (Meters)	Elevation 3.681 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 5017			
Date of Survey 4/17/2014		Ground Type Brush			
Established by WOOLPERT, INC.	Latitude 40°57'36.23479" N	Longitude 72°19'08.15834" W	Ellipsoid Ht. 2.453 (Meters)	Geoid Ht. -31.398 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000226502	Northing (UTM 18) 4537785.854 (Meters)	Easting (UTM 18) 725629.619 (Meters)	Elevation 33.851 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5018	
Date of Survey 4/19/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°51'36.02607" N	Longitude 72°36'40.22939" W	Ellipsoid Ht. -6.387 (Meters)	Geoid Ht. -31.540 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000100123	Northing (UTM 18) 4525963.420 (Meters)	Easting (UTM 18) 701336.846 (Meters)	Elevation 25.154 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5019	
Date of Survey 4/20/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°42'29.55353" N	Longitude 73°10'25.65255" W	Ellipsoid Ht. -30.392 (Meters)	Geoid Ht. -31.306 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999897741	Northing (UTM 18) 4507970.087 (Meters)	Easting (UTM 18) 654266.139 (Meters)	Elevation 0.915 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5020	
Date of Survey 4/19/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°49'06.39672" N	Longitude 72°52'46.74862" W	Ellipsoid Ht. -8.779 (Meters)	Geoid Ht. -31.382 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999995064	Northing (UTM 18) 4520766.255 (Meters)	Easting (UTM 18) 678818.926 (Meters)	Elevation 22.603 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 5021	
Date of Survey 4/20/2014				Ground Type Brush	
Established by WOOLPERT, INC.	Latitude 40°55'03.66227" N	Longitude 73°20'32.55134" W	Ellipsoid Ht. -18.208 (Meters)	Geoid Ht. -30.516 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.9998427	Northing (UTM 18) 4530941.966 (Meters)	Easting (UTM 18) 639584.871 (Meters)	Elevation 12.307 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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Long Island New York
SANDY LiDAR PROJECT



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6001	
Date of Survey 4/17/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 41°15'25.70666" N	Longitude 72°00'38.65499" W	Ellipsoid Ht. -13.127 (Meters)	Geoid Ht. -30.803 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000374406	Northing (UTM 18) 4571612.950 (Meters)	Easting (UTM 18) 750436.969 (Meters)	Elevation 17.675 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 6002			
Date of Survey 4/17/2014		Ground Type Trees			
Established by WOOLPERT, INC.	Latitude 41°16'39.20945" N	Longitude 71°58'48.39595" W	Ellipsoid Ht. -26.065 (Meters)	Geoid Ht. -30.763 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000391857	Northing (UTM 18) 4573968.825 (Meters)	Easting (UTM 18) 752924.333 (Meters)	Elevation 4.698 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6003	
Date of Survey 4/16/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 41°07'56.50185" N	Longitude 72°20'59.15001" W	Ellipsoid Ht. -15.431 (Meters)	Geoid Ht. -30.971 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000211743	Northing (UTM 18) 4556836.195 (Meters)	Easting (UTM 18) 722453.254 (Meters)	Elevation 15.540 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6004	
Date of Survey 4/16/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 41°01'11.14218" N	Longitude 72°29'35.22946" W	Ellipsoid Ht. -23.297 (Meters)	Geoid Ht. -31.197 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000150684	Northing (UTM 18) 4543978.224 (Meters)	Easting (UTM 18) 710778.965 (Meters)	Elevation 7.901 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6005	
Date of Survey 4/19/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°56'41.23491" N	Longitude 72°55'51.17940" W	Ellipsoid Ht. 11.442 (Meters)	Geoid Ht. -30.809 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999971662	Northing (UTM 18) 4534689.365 (Meters)	Easting (UTM 18) 674166.442 (Meters)	Elevation 42.251 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6006	
Date of Survey 4/20/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°52'10.16982" N	Longitude 73°15'44.29617" W	Ellipsoid Ht. -1.900 (Meters)	Geoid Ht. -30.629 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99986427	Northing (UTM 18) 4525722.797 (Meters)	Easting (UTM 18) 646434.009 (Meters)	Elevation 28.729 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6007	
Date of Survey 4/21/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°56'27.66491" N	Longitude 73°28'36.24045" W	Ellipsoid Ht. -21.999 (Meters)	Geoid Ht. -30.594 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999805836	Northing (UTM 18) 4533326.607 (Meters)	Easting (UTM 18) 628225.347 (Meters)	Elevation 8.595 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar QAQC Point # 6008	
Date of Survey 4/21/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°49'36.70433" N	Longitude 73°31'51.68930" W	Ellipsoid Ht. 42.937 (Meters)	Geoid Ht. -30.983 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999782152	Northing (UTM 18) 4520575.671 (Meters)	Easting (UTM 18) 623867.780 (Meters)	Elevation 73.919 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York		Station Description Lidar QAQC Point # 6009			
Date of Survey 4/22/2014		Ground Type Trees			
Established by WOOLPERT, INC.	Latitude 40°47'12.49943" N	Longitude 73°42'03.32448" W	Ellipsoid Ht. -23.632 (Meters)	Geoid Ht. -31.323 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999751582	Northing (UTM 18) 4515902.656 (Meters)	Easting (UTM 18) 609607.000 (Meters)	Elevation 7.691 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6010	
Date of Survey 4/19/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°45'29.24704" N	Longitude 72°52'23.08902" W	Ellipsoid Ht. -27.439 (Meters)	Geoid Ht. -31.617 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000001155	Northing (UTM 18) 4514083.232 (Meters)	Easting (UTM 18) 679535.687 (Meters)	Elevation 4.178 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6011	
Date of Survey 4/19/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°45'29.30242" N	Longitude 72°52'22.46601" W	Ellipsoid Ht. -27.492 (Meters)	Geoid Ht. -31.617 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000001228	Northing (UTM 18) 4514085.294 (Meters)	Easting (UTM 18) 679550.255 (Meters)	Elevation 4.125 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6012	
Date of Survey 4/19/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°45'30.06808" N	Longitude 72°52'22.77157" W	Ellipsoid Ht. -27.379 (Meters)	Geoid Ht. -31.616 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000001176	Northing (UTM 18) 4514108.731 (Meters)	Easting (UTM 18) 679542.517 (Meters)	Elevation 4.238 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6013	
Date of Survey 4/19/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°45'30.09649" N	Longitude 72°52'23.47292" W	Ellipsoid Ht. -27.457 (Meters)	Geoid Ht. -31.616 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000001115	Northing (UTM 18) 4514109.209 (Meters)	Easting (UTM 18) 679526.050 (Meters)	Elevation 4.159 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6014	
Date of Survey 4/18/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°53'09.50157" N	Longitude 72°55'34.23810" W	Ellipsoid Ht. -3.137 (Meters)	Geoid Ht. -31.038 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999976317	Northing (UTM 18) 4528169.232 (Meters)	Easting (UTM 18) 674717.439 (Meters)	Elevation 27.901 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6015	
Date of Survey 4/20/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°42'28.04451" N	Longitude 73°10'14.89661" W	Ellipsoid Ht. -30.113 (Meters)	Geoid Ht. -31.312 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999898661	Northing (UTM 18) 4507928.806 (Meters)	Easting (UTM 18) 654519.508 (Meters)	Elevation 1.199 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

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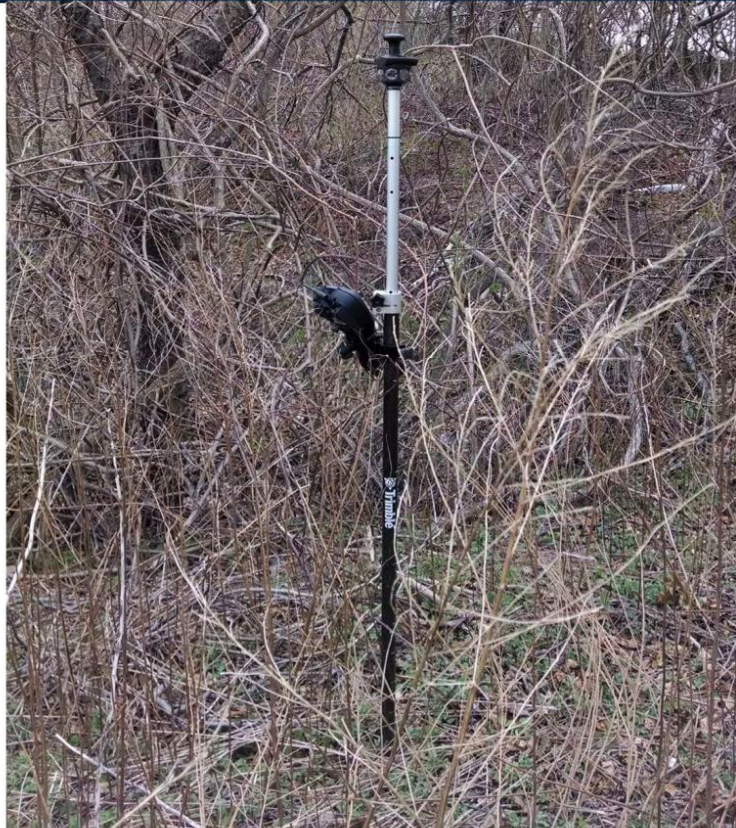


**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6016	
Date of Survey 4/18/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 41°04'29.16897" N	Longitude 71°56'22.90798" W	Ellipsoid Ht. -28.373 (Meters)	Geoid Ht. -31.051 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000418516	Northing (UTM 18) 4551570.911 (Meters)	Easting (UTM 18) 757102.043 (Meters)	Elevation 2.678 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6017	
Date of Survey 4/17/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°57'43.32357" N	Longitude 72°18'51.93231" W	Ellipsoid Ht. 3.638 (Meters)	Geoid Ht. -31.395 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.00022839	Northing (UTM 18) 4538016.131 (Meters)	Easting (UTM 18) 726002.249 (Meters)	Elevation 35.033 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6018	
Date of Survey 4/19/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°51'36.27071" N	Longitude 72°36'40.75947" W	Ellipsoid Ht. -6.259 (Meters)	Geoid Ht. -31.540 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.00010004	Northing (UTM 18) 4525970.625 (Meters)	Easting (UTM 18) 701324.229 (Meters)	Elevation 25.281 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6019	
Date of Survey 4/20/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°42'30.47985" N	Longitude 73°10'26.33320" W	Ellipsoid Ht. -30.556 (Meters)	Geoid Ht. -31.305 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999897704	Northing (UTM 18) 4507998.319 (Meters)	Easting (UTM 18) 654249.573 (Meters)	Elevation 0.749 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar QAQC Point # 6020	
Date of Survey 4/19/2014				Ground Type Trees	
Established by WOOLPERT, INC.	Latitude 40°49'07.00587" N	Longitude 72°52'43.36597" W	Ellipsoid Ht. -9.378 (Meters)	Geoid Ht. -31.383 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999995505	Northing (UTM 18) 4520786.958 (Meters)	Easting (UTM 18) 678897.719 (Meters)	Elevation 22.004 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar QAQC Point # 6021			
Date of Survey 4/20/2014		Ground Type Trees			
Established by WOOLPERT, INC.	Latitude 40°55'00.84061" N	Longitude 73°20'30.62318" W	Ellipsoid Ht. -17.586 (Meters)	Geoid Ht. -30.517 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999842763	Northing (UTM 18) 4530855.809 (Meters)	Easting (UTM 18) 639631.624 (Meters)	Elevation 12.932 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1001	
Date of Survey 4/17/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 41°15'27.03555" N	Longitude 72°00'37.81990" W	Ellipsoid Ht. -14.267 (Meters)	Geoid Ht. -30.802 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000374696	Northing (UTM 18) 4571654.607 (Meters)	Easting (UTM 18) 750454.994 (Meters)	Elevation 16.535 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1002	
Date of Survey 4/17/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 41°16'38.90506" N	Longitude 71°58'46.74778" W	Ellipsoid Ht. -26.045 (Meters)	Geoid Ht. -30.763 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000392095	Northing (UTM 18) 4573960.771 (Meters)	Easting (UTM 18) 752963.008 (Meters)	Elevation 4.719 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1003	
Date of Survey 4/16/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 41°08'09.34587" N	Longitude 72°21'01.25410" W	Ellipsoid Ht. -16.841 (Meters)	Geoid Ht. -30.961 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000211628	Northing (UTM 18) 4557230.826 (Meters)	Easting (UTM 18) 722392.131 (Meters)	Elevation 14.120 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1004	
Date of Survey 4/16/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 41°01'08.79062" N	Longitude 72°29'35.95052" W	Ellipsoid Ht. -22.442 (Meters)	Geoid Ht. -31.199 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000150474	Northing (UTM 18) 4543905.217 (Meters)	Easting (UTM 18) 710764.207 (Meters)	Elevation 8.757 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1005	
Date of Survey 4/18/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°56'38.27715" N	Longitude 72°56'31.57842" W	Ellipsoid Ht. 13.249 (Meters)	Geoid Ht. -30.793 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999967347	Northing (UTM 18) 4534575.847 (Meters)	Easting (UTM 18) 673223.932 (Meters)	Elevation 44.042 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York		Station Description Lidar Control Point # 1006			
Date of Survey 4/20/2014		Ground Type Asphalt			
Established by WOOLPERT, INC.	Latitude 40°52'21.96037" N	Longitude 73°15'23.67764" W	Ellipsoid Ht. 5.559 (Meters)	Geoid Ht. -30.622 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99986482	Northing (UTM 18) 4526095.984 (Meters)	Easting (UTM 18) 646909.429 (Meters)	Elevation 36.181 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1007	
Date of Survey 4/21/2014				Ground Type Bare Ground	
Established by WOOLPERT, INC.	Latitude 40°56'29.38647" N	Longitude 73°28'37.42751" W	Ellipsoid Ht. -24.925 (Meters)	Geoid Ht. -30.594 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999806203	Northing (UTM 18) 4533379.212 (Meters)	Easting (UTM 18) 628196.665 (Meters)	Elevation 5.668 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar Control Point # 1008	
Date of Survey 4/21/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°51'53.00518" N	Longitude 73°31'53.50987" W	Ellipsoid Ht. -15.255 (Meters)	Geoid Ht. -30.883 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999790914	Northing (UTM 18) 4524778.015 (Meters)	Easting (UTM 18) 623754.666 (Meters)	Elevation 15.628 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar Control Point # 1009	
Date of Survey 4/22/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°47'13.54500" N	Longitude 73°42'08.38166" W	Ellipsoid Ht. -21.860 (Meters)	Geoid Ht. -31.322 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999750984	Northing (UTM 18) 4515933.142 (Meters)	Easting (UTM 18) 609487.995 (Meters)	Elevation 9.462 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar Control Point # 1010	
Date of Survey 4/22/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°42'58.23074" N	Longitude 73°39'05.32095" W	Ellipsoid Ht. -8.424 (Meters)	Geoid Ht. -31.550 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999761016	Northing (UTM 18) 4508125.027 (Meters)	Easting (UTM 18) 613899.457 (Meters)	Elevation 23.126 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Lidar Control Point # 1011	
Date of Survey 4/21/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°38'28.38874" N	Longitude 73°37'57.53977" W	Ellipsoid Ht. -27.824 (Meters)	Geoid Ht. -31.757 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999768915	Northing (UTM 18) 4499828.883 (Meters)	Easting (UTM 18) 615619.228 (Meters)	Elevation 3.932 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1012	
Date of Survey 4/21/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°37'46.22679" N	Longitude 73°14'05.91542" W	Ellipsoid Ht. -26.724 (Meters)	Geoid Ht. -31.520 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999878509	Northing (UTM 18) 4499127.621 (Meters)	Easting (UTM 18) 649272.901 (Meters)	Elevation 4.797 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1013	
Date of Survey 4/18/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°44'27.65609" N	Longitude 72°52'21.92847" W	Ellipsoid Ht. -30.492 (Meters)	Geoid Ht. -31.679 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000001959	Northing (UTM 18) 4512184.562 (Meters)	Easting (UTM 18) 679608.953 (Meters)	Elevation 1.188 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1014	
Date of Survey 4/18/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°52'28.82745" N	Longitude 72°55'08.18487" W	Ellipsoid Ht. 3.788 (Meters)	Geoid Ht. -31.094 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999977991	Northing (UTM 18) 4526929.390 (Meters)	Easting (UTM 18) 675357.018 (Meters)	Elevation 34.882 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1015	
Date of Survey 4/17/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°53'54.38500" N	Longitude 72°18'43.76157" W	Ellipsoid Ht. -29.057 (Meters)	Geoid Ht. -31.522 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000235795	Northing (UTM 18) 4530961.437 (Meters)	Easting (UTM 18) 726410.427 (Meters)	Elevation 2.465 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC

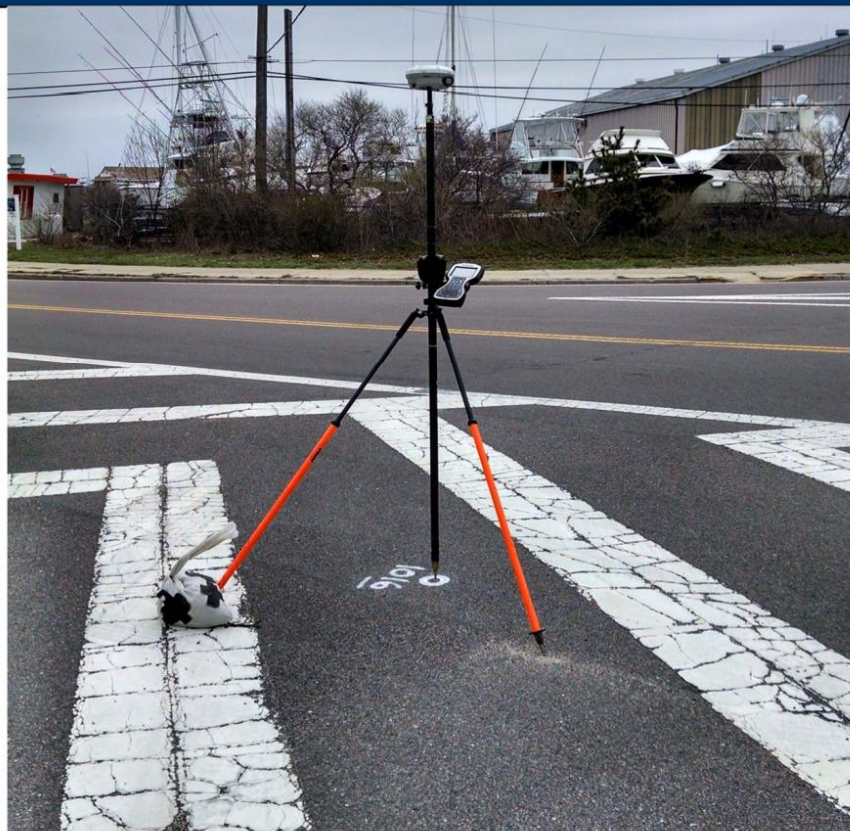


**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1016	
Date of Survey 4/18/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 41°04'19.07969" N	Longitude 71°56'31.25022" W	Ellipsoid Ht. -28.973 (Meters)	Geoid Ht. -31.058 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000417446	Northing (UTM 18) 4551252.897 (Meters)	Easting (UTM 18) 756918.260 (Meters)	Elevation 2.084 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1017	
Date of Survey 4/17/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 41°00'00.09904" N	Longitude 72°17'48.22419" W	Ellipsoid Ht. -30.662 (Meters)	Geoid Ht. -31.330 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000241345	Northing (UTM 18) 4542280.336 (Meters)	Easting (UTM 18) 727361.039 (Meters)	Elevation 0.668 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1018	
Date of Survey 4/17/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°53'35.58279" N	Longitude 72°29'37.62792" W	Ellipsoid Ht. -16.524 (Meters)	Geoid Ht. -31.524 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000151444	Northing (UTM 18) 4529927.191 (Meters)	Easting (UTM 18) 711126.027 (Meters)	Elevation 14.999 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1019	
Date of Survey 4/20/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°42'26.30540" N	Longitude 73°10'18.55421" W	Ellipsoid Ht. -30.156 (Meters)	Geoid Ht. -31.313 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999898346	Northing (UTM 18) 4507873.391 (Meters)	Easting (UTM 18) 654434.794 (Meters)	Elevation 1.157 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1020	
Date of Survey 4/19/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°49'03.00355" N	Longitude 72°52'43.85302" W	Ellipsoid Ht. -9.644 (Meters)	Geoid Ht. -31.387 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99999551	Northing (UTM 18) 4520663.258 (Meters)	Easting (UTM 18) 678889.297 (Meters)	Elevation 21.743 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Lidar Control Point # 1021	
Date of Survey 4/20/2014				Ground Type Asphalt	
Established by WOOLPERT, INC.	Latitude 40°55'00.26493" N	Longitude 73°20'34.80262" W	Ellipsoid Ht. -18.608 (Meters)	Geoid Ht. -30.518 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.999842588	Northing (UTM 18) 4530836.203 (Meters)	Easting (UTM 18) 639534.194 (Meters)	Elevation 11.910 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Survey Control Point # 20000	
Date of Survey 4/17/2014				Ground Type Nail Set	
Established by WOOLPERT, INC.	Latitude 41°15'27.07724" N	Longitude 72°00'35.00137" W	Ellipsoid Ht. -14.031 (Meters)	Geoid Ht. -30.802 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000375064	Northing (UTM 18) 4571658.152 (Meters)	Easting (UTM 18) 750520.550 (Meters)	Elevation 16.771 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Nassau County, New York				Station Description Survey Control Point # 20001	
Date of Survey 4/22/2014				Ground Type Nail Set	
Established by WOOLPERT, INC.	Latitude 40°47'15.66707" N	Longitude 73°42'10.04703" W	Ellipsoid Ht. -21.251 (Meters)	Geoid Ht. -31.321 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 0.99975078	Northing (UTM 18) 4515998.001 (Meters)	Easting (UTM 18) 609447.995 (Meters)	Elevation 10.070 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Survey Control Point # 31004	
Date of Survey 4/18/2014				Ground Type Nail Set	
Established by WOOLPERT, INC.	Latitude 40°57'42.71415" N	Longitude 72°18'52.67324" W	Ellipsoid Ht. 3.713 (Meters)	Geoid Ht. -31.395 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000228285	Northing (UTM 18) 4537996.803 (Meters)	Easting (UTM 18) 725985.505 (Meters)	Elevation 35.108 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Survey Control Point # 31005	
Date of Survey 4/19/2014				Ground Type Nail Set	
Established by WOOLPERT, INC.	Latitude 40°45'27.23016" N	Longitude 72°52'23.60268" W	Ellipsoid Ht. -27.585 (Meters)	Geoid Ht. -31.619 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000001131	Northing (UTM 18) 4514020.743 (Meters)	Easting (UTM 18) 679525.150 (Meters)	Elevation 4.034 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



Photogrammetric Ground Control Information Sheet

USGS/NGTOC



**Long Island New York
SANDY LiDAR PROJECT**



County, State Suffolk County, New York				Station Description Survey Control Point # 31006	
Date of Survey 4/19/2014				Ground Type Nail Set	
Established by WOOLPERT, INC.	Latitude 40°45'28.78156" N	Longitude 72°52'23.94701" W	Ellipsoid Ht. -27.395 (Meters)	Geoid Ht. -31.617 (Meters)	Horizontal Datum NAD 83 (2011)
Combined Scale Factor 1.000001061	Northing (UTM 18) 4514068.390 (Meters)	Easting (UTM 18) 679515.916 (Meters)	Elevation 4.222 (Meters)	Vertical Datum NAVD 88	Geoid Model GEOID 12A

Picture:



SECTION 4: EXISTING CONTROL STATION INFORMATION SHEETS

This contains the published Survey Control information sheets used in the final control network for the USGS/NGTOC, Task Order: Long Island, New York Sandy Lidar project.

The NGS Data Sheet

PROGRAM = datasheet95, VERSION = 8.5

1 National Geodetic Survey, Retrieval Date = NOVEMBER 20, 2014

KU4550 *****

KU4550 DESIGNATION - 11 E 12 N

KU4550 PID - KU4550

KU4550 STATE/COUNTY- NY/NASSAU

KU4550 COUNTRY - US

KU4550 USGS QUAD - FREEPORT (1979)

KU4550

KU4550 *CURRENT SURVEY CONTROL

KU4550

KU4550* NAD 83(2011) POSITION- 40 43 40.46038(N) 073 34 26.21558(W) ADJUSTED

KU4550* NAD 83(2011) ELLIP HT- -5.580 (meters) (06/27/12) ADJUSTED

KU4550* NAD 83(2011) EPOCH - 2010.00

KU4550* [NAVD 88](#) ORTHO HEIGHT - 25.805 (meters) 84.66 (feet) ADJUSTED

KU4550

KU4550 NAD 83(2011) X - 1,368,744.384 (meters) COMP

KU4550 NAD 83(2011) Y - -4,642,799.601 (meters) COMP

KU4550 NAD 83(2011) Z - 4,139,567.950 (meters) COMP

KU4550 LAPLACE CORR - 4.38 (seconds) DEFLEC12A

KU4550 GEOID HEIGHT - -31.38 (meters) GEOID12A

KU4550 DYNAMIC HEIGHT - 25.795 (meters) 84.63 (feet) COMP

KU4550 MODELED GRAVITY - 980,230.7 (mgal) NAVD 88

KU4550

KU4550 VERT ORDER - THIRD

KU4550

KU4550 FGDC Geospatial Positioning Accuracy Standards (95% confidence, cm)

KU4550 Type Horiz Ellip Dist(km)

KU4550 -----

KU4550 NETWORK 1.47 2.84

KU4550 -----

KU4550 MEDIAN LOCAL ACCURACY AND DIST (005 points) 0.94 1.90 1.97

KU4550 -----

KU4550 NOTE: Click [here](#) for information on individual local accuracy

KU4550 values and other accuracy information.

KU4550

KU4550

KU4550.The horizontal coordinates were established by GPS observations

KU4550.and adjusted by the National Geodetic Survey in June 2012.

KU4550

KU4550.NAD 83(2011) refers to NAD 83 coordinates where the reference

KU4550.frame has been affixed to the stable North American tectonic plate. See

KU4550.[NA2011](#) for more information.

KU4550

KU4550.The horizontal coordinates are valid at the epoch date displayed above

KU4550.which is a decimal equivalence of Year/Month/Day.

KU4550

KU4550.The orthometric height was determined by differential leveling and

KU4550.adjusted by the NATIONAL GEODETIC SURVEY

KU4550.in August 1995.

KU4550

KU4550.The X, Y, and Z were computed from the position and the ellipsoidal ht.

KU4550_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
KU4550+STABILITY: POSITION/ELEVATION WELL
KU4550_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
KU4550+SATELLITE: SATELLITE OBSERVATIONS - May 21, 2005

KU4550_ROD/PIPE-DEPTH: 20.6 meters

KU4550_SLEEVE-DEPTH : 1.52 meters

KU4550

KU4550 HISTORY - Date Condition Report By

KU4550 HISTORY - 1990 MONUMENTED SBAS

KU4550 HISTORY - 20050521 GOOD GEOCAC

KU4550

KU4550 STATION DESCRIPTION

KU4550

KU4550'DESCRIBED BY SIDNEY B BOWNE AND SON 1990

KU4550'THE POINT IS LOCATED IN EAST MEADOW, TOWN OF HEMPSTEAD, IN EISENHOWER

KU4550'MEMORIAL PARK, 1057 FEET (322.2 M) SOUTH OF THE CENTERLINE OF THE

KU4550'EASTBOUND LANES OF PARK BOULEVARD (ALSO KNOWN AS BICENTENNIAL

KU4550'BOULEVARD) AND 1840 FEET (560.8 M) EAST OF THE CENTERLINE OF THE 4

KU4550'LANE PORTION OF MERRICK AVENUE, IN THE GRASS AREA ADJACENT TO THE

KU4550'ASPHALT WALK. THE LOCATION TIES ARE 43.3 FEET (13.2 M) FROM THE

KU4550'NORTH WEST CORNER OF THE CHAIN LINK FENCE, 51.0 FEET (15.5 M) FROM

KU4550'THE SOUTH WEST CORNER OF THE BICYCLE RENTAL BUILDING AND 13.0 FEET

KU4550'(4.0 M) FROM THE CENTER OF THE 1-FOOT DIAMETER SEWER MANHOLE CASTING.

KU4550

KU4550 STATION RECOVERY (2005)

KU4550

KU4550'RECOVERY NOTE BY GEOCACHING 2005 (PR)

KU4550'RECOVERED IN GOOD CONDITION.

The NGS Data Sheet

PROGRAM = datasheet95, VERSION = 8.5

1 National Geodetic Survey, Retrieval Date = NOVEMBER 20, 2014

KU0337 *****

KU0337 CBN - This is a Cooperative Base Network Control Station.

KU0337 DESIGNATION - Q 334

KU0337 PID - KU0337

KU0337 STATE/COUNTY- NY/SUFFOLK

KU0337 COUNTRY - US

KU0337 USGS QUAD - WADING RIVER (1967)

KU0337

KU0337 *CURRENT SURVEY CONTROL

KU0337

KU0337* NAD 83(2011) POSITION- 40 56 53.29912(N) 072 48 31.26561(W) ADJUSTED

KU0337* NAD 83(2011) ELLIP HT- -0.032 (meters) (06/27/12) ADJUSTED

KU0337* NAD 83(2011) EPOCH - 2010.00

KU0337* [NAVD 88](#) ORTHO HEIGHT - 30.985 (meters) 101.66 (feet) ADJUSTED

KU0337

KU0337 NAD 83(2011) X - 1,425,905.721 (meters) COMP

KU0337 NAD 83(2011) Y - -4,608,830.092 (meters) COMP

KU0337 NAD 83(2011) Z - 4,158,074.811 (meters) COMP

KU0337 LAPLACE CORR - -3.42 (seconds) DEFLEC12A

KU0337 GEOID HEIGHT - -31.01 (meters) GEOID12A

KU0337 DYNAMIC HEIGHT - 30.973 (meters) 101.62 (feet) COMP

KU0337 MODELED GRAVITY - 980,248.6 (mgal) NAVD 88

KU0337

KU0337 VERT ORDER - SECOND CLASS 0

KU0337

KU0337 FGDC Geospatial Positioning Accuracy Standards (95% confidence, cm)

KU0337 Type Horiz Ellip Dist(km)

KU0337 -----

KU0337 NETWORK 0.51 1.74

KU0337 -----

KU0337 MEDIAN LOCAL ACCURACY AND DIST (071 points) 0.62 1.92 105.59

KU0337 -----

KU0337 NOTE: Click [here](#) for information on individual local accuracy

KU0337 values and other accuracy information.

KU0337

KU0337

KU0337.The horizontal coordinates were established by GPS observations

KU0337.and adjusted by the National Geodetic Survey in June 2012.

KU0337

KU0337.NAD 83(2011) refers to NAD 83 coordinates where the reference

KU0337.frame has been affixed to the stable North American tectonic plate. See

KU0337.[NA2011](#) for more information.

KU0337

KU0337.The horizontal coordinates are valid at the epoch date displayed above

KU0337.which is a decimal equivalence of Year/Month/Day.

KU0337

KU0337.The orthometric height was determined by differential leveling and

KU0337.adjusted by the NATIONAL GEODETIC SURVEY

KU0337.in June 1991.

KU0337

KU0337.[Photographs](#) are available for this station.

KU0337 HISTORY - 1987 GOOD USPSQD
KU0337 HISTORY - 20010716 GOOD NYDT
KU0337 HISTORY - 20030303 GOOD NGS
KU0337 HISTORY - 20060629 GOOD NYDT
KU0337 HISTORY - 20120118 GOOD DEWDAV

KU0337

KU0337 STATION DESCRIPTION

KU0337

KU0337'DESCRIBED BY COAST AND GEODETIC SURVEY 1950

KU0337'1 MI SE FROM WADING RIVER.

KU0337'0.95 MILE SOUTHEAST ALONG STATE HIGHWAY 25 A FROM THE JUNCTION OF
KU0337'SCHULTZ AVENUE AT WADING RIVER, SUFFOLK COUNTY, THENCE 0.8 MILE
KU0337'EAST ALONG SOUND AVENUE EXTENDED, 0.3 MILE WEST OF THE INTERSECTION
KU0337'OF COUNTY HIGHWAY 54 LEADING NORTH TO WILDWOOD STATE PARK, 16.2
KU0337'FEET NORTH OF THE CENTERLINE OF THE ROAD, 4.2 FEET SOUTHEAST
KU0337'OF POWERLINE POLE NYT 681, 3 FEET WEST OF A WHITE WOODEN WITNESS
KU0337'POST, AND LEVEL WITH THE ROAD. A STANDARD DISK, STAMPED Q 334
KU0337'1950 AND SET IN THE TOP OF A CONCRETE POST PROJECTING 4 INCHES
KU0337'ABOVE GROUND.

KU0337

KU0337 STATION RECOVERY (1987)

KU0337

KU0337'RECOVERY NOTE BY US POWER SQUADRON 1987 (JK)

KU0337'RECOVERED IN GOOD CONDITION.

KU0337

KU0337 STATION RECOVERY (2001)

KU0337

KU0337'RECOVERY NOTE BY NY DEPT OF TRANSP 2001 (DH)

KU0337'RECOVERED AS DESCRIBED.

KU0337'

KU0337'

KU0337

KU0337 STATION RECOVERY (2003)

KU0337

KU0337'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2003 (DH)

KU0337'LOCATED ABOUT I-MILE SOUTH EAST OF WADING RIVER,

KU0337'OWNERSHIP-- SUFFOLK COUNTY HIGHWAY DEPARTMENT. TO REACH FROM THE

KU0337'JUNCTION OF

KU0337'WADING

KU0337'RIVER MANOR ROAD AND STATE HIGHWAY 25 A, GO 1.0 MILE SOUTHEAST ALONG

KU0337'HIGHWAY 25 A TO

KU0337'SOUND AVENUE ON THE RIGHT, TURN RIGHT, EAST, GO 0.8 MILE TO THE

KU0337'STATION ON THE LEFT.

KU0337'WHICH IS 0.3 M WEST OF THE INTERSECTION OF COUNTY ROAD 54 LEADING

KU0337'NORTH TO WILDWOOD

KU0337'STATE PARK.

KU0337'THE STATION IS 16.2 FT NORTH OF THE ROAD CENTER LINE, 4.2 FEET

KU0337'SOUTHEAST OF UTILITY POLE

KU0337'NUMBER NYT 681, AND THE MONUMENT IS RECESSED 12-INCHES BELOW THE

KU0337'GROUND SURFACE.

KU0337'

KU0337'

KU0337

KU0337 STATION RECOVERY (2006)

KU0337

KU0337'RECOVERY NOTE BY NY DEPT OF TRANSP 2006 (PAF)

KU0337'RECOVERED IN GOOD CONDITION.
KU0337
KU0337 STATION RECOVERY (2012)
KU0337
KU0337'RECOVERY NOTE BY DEWBERRY DAVIS 2012 (GDS)
KU0337'RECOVERED IN GOOD CONDITION.

The NGS Data Sheet

PROGRAM = datasheet95, VERSION = 8.5

1 National Geodetic Survey, Retrieval Date = NOVEMBER 20, 2014

LX0248 *****

LX0248 CBN - This is a Cooperative Base Network Control Station.

LX0248 DESIGNATION - U 325

LX0248 PID - LX0248

LX0248 STATE/COUNTY- NY/SUFFOLK

LX0248 COUNTRY - US

LX0248 USGS QUAD - ORIENT (1976)

LX0248

LX0248 *CURRENT SURVEY CONTROL

LX0248

LX0248* NAD 83(2011) POSITION- 41 08 32.19881(N) 072 19 00.88833(W) ADJUSTED

LX0248* NAD 83(2011) ELLIP HT- -28.736 (meters) (06/27/12) ADJUSTED

LX0248* NAD 83(2011) EPOCH - 2010.00

LX0248* [NAVD 88](#) ORTHO HEIGHT - 2.234 (meters) 7.33 (feet) ADJUSTED

LX0248

LX0248 NAD 83(2011) X - 1,461,103.518 (meters) COMP

LX0248 NAD 83(2011) Y - -4,582,912.728 (meters) COMP

LX0248 NAD 83(2011) Z - 4,174,316.322 (meters) COMP

LX0248 LAPLACE CORR - -0.80 (seconds) DEFLEC12A

LX0248 GEOID HEIGHT - -30.96 (meters) GEOID12A

LX0248 DYNAMIC HEIGHT - 2.233 (meters) 7.33 (feet) COMP

LX0248 MODELED GRAVITY - 980,263.3 (mgal) NAVD 88

LX0248

LX0248 VERT ORDER - SECOND CLASS 0

LX0248

LX0248 FGDC Geospatial Positioning Accuracy Standards (95% confidence, cm)

LX0248 Type Horiz Ellip Dist(km)

LX0248 -----

LX0248 NETWORK 1.28 2.16

LX0248 -----

LX0248 MEDIAN LOCAL ACCURACY AND DIST (069 points) 1.32 2.29 140.46

LX0248 -----

LX0248 NOTE: Click [here](#) for information on individual local accuracy

LX0248 values and other accuracy information.

LX0248

LX0248

LX0248.The horizontal coordinates were established by GPS observations

LX0248.and adjusted by the National Geodetic Survey in June 2012.

LX0248

LX0248.NAD 83(2011) refers to NAD 83 coordinates where the reference

LX0248.frame has been affixed to the stable North American tectonic plate. See

LX0248.[NA2011](#) for more information.

LX0248

LX0248.The horizontal coordinates are valid at the epoch date displayed above

LX0248.which is a decimal equivalence of Year/Month/Day.

LX0248

LX0248.The orthometric height was determined by differential leveling and

LX0248.adjusted by the NATIONAL GEODETIC SURVEY

LX0248.in June 1991.

LX0248

LX0248.[Photographs](#) are available for this station.

LX0248
LX0248.The X, Y, and Z were computed from the position and the ellipsoidal ht.
LX0248
LX0248.The Laplace correction was computed from DEFLEC12A derived deflections.
LX0248
LX0248.The ellipsoidal height was determined by GPS observations
LX0248.and is referenced to NAD 83.
LX0248
LX0248.The dynamic height is computed by dividing the NAVD 88
LX0248.geopotential number by the normal gravity value computed on the
LX0248.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
LX0248.degrees latitude (g = 980.6199 gals.).
LX0248
LX0248.The modeled gravity was interpolated from observed gravity values.
LX0248
LX0248. The following values were computed from the NAD 83(2011) position.
LX0248
LX0248; North East Units Scale Factor Converg.
LX0248;SPC NY L - 109,697.710 441,294.274 MT 1.00000787 +1 06 03.2
LX0248;SPC NY L - 359,899.90 1,447,812.96 sFT 1.00000787 +1 06 03.2
LX0248;UTM 18 - 4,558,021.624 725,176.959 MT 1.00022408 +1 45 57.7
LX0248
LX0248! - Elev Factor x Scale Factor = Combined Factor
LX0248!SPC NY L - 1.00000451 x 1.00000787 = 1.00001238
LX0248!UTM 18 - 1.00000451 x 1.00022408 = 1.00022859
LX0248
LX0248 SUPERSEDED SURVEY CONTROL
LX0248
LX0248 NAD 83(2007)- 41 08 32.19916(N) 072 19 00.88922(W) AD(2002.00) 0
LX0248 ELLIP H (02/10/07) -28.720 (m) GP(2002.00)
LX0248 NAD 83(1996)- 41 08 32.19931(N) 072 19 00.88944(W) AD() A
LX0248 ELLIP H (09/18/02) -28.717 (m) GP() 4 2
LX0248 NAD 83(1996)- 41 08 32.19942(N) 072 19 00.88831(W) AD() 2
LX0248 ELLIP H (01/11/99) -28.621 (m) GP() 4 1
LX0248 NAD 83(1996)- 41 08 32.19945(N) 072 19 00.88835(W) AD() 2
LX0248 NAD 83(1992)- 41 08 32.19808(N) 072 19 00.88758(W) AD() 2
LX0248 NAD 83(1986)- 41 08 32.19982(N) 072 19 00.89318(W) AD() 2
LX0248 NAD 27 - 41 08 31.84716(N) 072 19 02.58808(W) AD() 2
LX0248 NAVD 88 (09/18/02) 2.23 (m) 7.3 (f) LEVELING 3
LX0248 NGVD 29 (??/??/92) 2.523 (m) 8.28 (f) ADJ UNCH 2 0
LX0248 NGVD 29 (07/19/86) 2.52 (m) 8.3 (f) LEVELING 3
LX0248
LX0248.Superseded values are not recommended for survey control.
LX0248
LX0248.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
LX0248.[See file dsdata.txt](#) to determine how the superseded data were derived.
LX0248
LX0248_U.S. NATIONAL GRID SPATIAL ADDRESS: 18TYL2517658021(NAD 83)
LX0248
LX0248_MARKER: DB = BENCH MARK DISK
LX0248_SETTING: 32 = SET IN A RETAINING WALL OR CONCRETE LEDGE
LX0248_SP_SET: SEAWALL
LX0248_STAMPING: U 325 1943
LX0248_MARK LOGO: CGS
LX0248_MAGNETIC: N = NO MAGNETIC MATERIAL
LX0248_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

LX0248+STABILITY: SURFACE MOTION
LX0248_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
LX0248+SATELLITE: SATELLITE OBSERVATIONS - June 11, 2013

LX0248

LX0248 HISTORY	- Date	Condition	Report By
LX0248 HISTORY	- 1943	MONUMENTED	CGS
LX0248 HISTORY	- 1965	GOOD	CGS
LX0248 HISTORY	- 19880607	GOOD	NGS
LX0248 HISTORY	- 19940721	GOOD	NYDPW
LX0248 HISTORY	- 19951030	GOOD	NYDT
LX0248 HISTORY	- 20010716	GOOD	NYDT
LX0248 HISTORY	- 20050310	GOOD	AME
LX0248 HISTORY	- 20090920	GOOD	GEOCAC
LX0248 HISTORY	- 20130611	GOOD	NYSDEC

LX0248

STATION DESCRIPTION

LX0248

LX0248'DESCRIBED BY COAST AND GEODETIC SURVEY 1943
LX0248'SEE STATION RIENT.

LX0248

STATION RECOVERY (1965)

LX0248

LX0248'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1965
LX0248'0.8 MI W FROM ORIENT.

LX0248'4.6 MILES NORTHEAST ALONG STATE HIGHWAY 25 FROM THE POST OFFICE
LX0248'AT GREENPORT, SUFFOLK COUNTY, ON THE OUTSIDE OF A CURVE IN THE
LX0248'HIGHWAY, AT THE Y-JUNCTION OF A ROAD LEADING NORTHEAST, 50 FEET
LX0248'NORTH OF THE CENTERLINE OF THE HIGHWAY, 37 FEET NORTHWEST OF
LX0248'THE CENTERLINE OF THE ROAD, 56.3 FEET SOUTHWEST OF POLE 224,
LX0248'AND IN THE TOP OF A CONCRETE SEAWALL. A STANDARD DISK, STAMPED
LX0248'U 325 1943. NOTE-- 60.6 FEET NE OF POWER LINE POLE NO. 151+225
LX0248'AND 25.8 FEET W OF A METAL WITNESS POST.

LX0248

STATION RECOVERY (1988)

LX0248

LX0248'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1988
LX0248'THE STATION IS LOCATED ABOUT 2.4 KM (1.50 MI) NORTHEAST OF EAST
LX0248'MARION, 1.3 KM (0.80 MI) WEST OF ORIENT, ALONG THE NORTH SIDE OF STATE
LX0248'HIGHWAY 25, ON THE RIGHT-OF-WAY, SET IN TOP OF A SEAWALL.
LX0248'OWNERSHIP--NEW YORK DEPARTMENT OF HIGHWAYS.
LX0248'TO REACH THE STATION FROM THE JUNCTION OF STATE HIGHWAY 25 AND VILLAGE
LX0248'LANE IN ORIENT, GO WEST FOR 1.3 KM (0.80 MI) ON HIGHWAY 25 TO THE
LX0248'STATION ON THE RIGHT.

LX0248'THE STATION IS A STANDARD CGS DISK SET INTO A DRILL HOLE IN THE TOP
LX0248'CENTER OF A CONCRETE SEA WALL PROJECTING 1 METER ABOVE THE GROUND.
LX0248'LOCATED 18.5 M (60.7 FT) NORTHEAST FROM UTILITY POLE NUMBER 151-225,
LX0248'15.2 M (49.9 FT) NORTHWEST FROM THE CENTER OF THE HIGHWAY, 7.9 M
LX0248'(25.9 FT) WEST FROM A METAL WITNESS POST, AND 0.4 M (1.3 FT) SOUTHEAST
LX0248'FROM THE NORTHWEST EDGE OF THE CONCRETE SEA WALL.
LX0248'DESCRIBED BY C.L. SMITH, TYPED BY R.L. ZURFLUH.

LX0248

STATION RECOVERY (1994)

LX0248

LX0248'RECOVERY NOTE BY NY DEPT OF PUB WORKS 1994 (SC)
LX0248'RECOVERED AS DESCRIBED.

LX0248

LX0248 STATION RECOVERY (1995)
LX0248
LX0248'RECOVERY NOTE BY NY DEPT OF TRANSP 1995 (ES)
LX0248'SITE STILL SUITABLE FOR SATELLITE OBSERVATIONS.
LX0248
LX0248 STATION RECOVERY (2001)
LX0248
LX0248'RECOVERY NOTE BY NY DEPT OF TRANSP 2001 (DH)
LX0248'RECOVERED AS DESCRIBED.
LX0248'
LX0248
LX0248 STATION RECOVERY (2005)
LX0248
LX0248'RECOVERY NOTE BY AERO-METRIC ENGINEERING INCORPORATED 2005 (NJ)
LX0248'FOUND IN GOOD CONDITION
LX0248
LX0248 STATION RECOVERY (2009)
LX0248
LX0248'RECOVERY NOTE BY GEOCACHING 2009 (RLM)
LX0248'RECOVERED IN GOOD CONDITION.
LX0248'
LX0248'
LX0248
LX0248 STATION RECOVERY (2013)
LX0248
LX0248'RECOVERY NOTE BY NEW YORK DEPT ENVIRONAL CONSER 2013 (RWP)
LX0248'RECOVERED IN GOOD CONDITION.

SECTION 5: GPS CONTROL POINTS

This section contains a graphical representation of the new quality control check points and existing ground control stations used for this lidar project.

