Pennoni
PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

LBGI 1001 February 15, 2010

# REPORT OF LAND SURVEY AND ASSOCIATED SURVEY CONTROL

## RE: SURVEY OF THE BOUND BROOK, MIDDLESEX COUNTY, NEW JERSEY

## THE CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE

## (CDE-OU4Q-REQ 01)

## PREPARED FOR: THE LOUIS BERGER GROUP, INC.

Pennoni Associates Inc. (PAI) was contracted by The Louis Berger Group, Inc., (LBG), on October 18, 2010 to provide professional land surveying services to LBG and to provide them with the necessary Survey Control points and layout for subsequent studies and analysis of the environmental conditions of the Bound Brook. Field surveying began immediately thereafter. Our primary professional obligations were to: 1-Establish general mobilization /survey control. 2- Establish transect control points at approximate 500' intervals, on both sides of the Bound Brook for its entire 7.5 mile length. 3- Prepare topographic cross sections of the Bound Brook at 1000' intervals for its entire 7.5 mile length. 4- Prepare a plan of survey and report of our efforts. This survey was conducted under the immediate direction and supervision of Dennis S. DiBlasio -Project Principal, NJ P.L.S. GS 02380700 and coordinated with Louis Berger's project representative, Dr. Amy Marie AccardiDey. Additional PAI survey personnel are: Donald Lance-Senior Surveyor, P.L.S., James Pollock / Jeff Weber-Field chief of survey parties, and Joseph Zito-cad technician.

The survey area begins at the confluence of the Bound Brook with the Green Brook (40 deg-35'- 03" N / 074 deg- 30'-07"W) and extends upstream 7.5 miles (40deg-33'-51"N / 074deg-24'-02"W). This survey area includes the Boroughs of Middlesex, Piscataway, and South Plainfield, NJ.

The primary survey control network was established by using survey grade GPS equipment in the Static Mission. The GPS equipment used for this process was **LEICA 1200** "Smart Rovers" tied to 5 published National Geodetic Survey (NGS) survey control monuments of 1st class or higher. These monuments were:

1. PID AG9916-NJ/MIDDLESEX
2. PID KV6524-NJ/SOMERSET
3. PID KV6616-NJ/UNION
4. PID KV6805-NJ MIDDLESEX
5. PID 6826-NJ/UNION

A listing of these NGS control monuments is attached as "The NGS Data Sheet"
The results of the processed comparative survey are shown on the attached "Results-Baseline" and "Loops and Misclosures". These results note accuracy ranges from 1:2,930.544 (high) to 1:608,640 (low).

Our data as submitted are relative to the North American Datum of 1983, (NAD 83), and the North American Vertical Datum of 1988, (NAVD 88). Final horizontal values are shown in New Jersey State Plane Coordinates System, (NJSPCS).

Upon completion of this primary survey control process 10 secondary "site specific" survey control points were established to be used for all subsequent surveying for this project. These points are shown on our Plan of Survey sheets 1 through 4.

Survey "Transect Markers" were set along the Bound Brook on both sides of the banks at approximately 500' intervals. These markers are constructed of 6' x 1-1/2"x ¼" solid fiberglass, orange in color. These markers are identified by a PAI point No., NJSPCS Northing/ Easting, NAVD 88 Ground elevation and Transect No. The markers were set in the field by tying them to the secondary "site specific" survey control utilizing **Topcon Robotic Total Stations**, 03", (3 seconds of arc), model no **GPT 8200**. Data collection utilized integrated **TDS Ranger** data collectors. Horizontal and vertical angles were measured to the nearest 03" of arc and horizontal distances were measured to the nearest 0.01'.

All field work began from one secondary survey control point and tied to a minimum of 1 other secondary control point. These results were checked to assure horizontal and vertical precision. Our field effort for this portion of the project concluded on or about December 01, 2010.

A "Plan of Survey" dated 12/01/2010, job no. LBGI 1001, sheets S0301 through S0304 was prepared detailing the referenced field events. This plan was prepared in an AutoCAD version 2009 format.

To date we have yet to complete the topographic cross sections for this project. We anticipate resuming field operation mid March of 2011 +/-.

Dennis S. DiBlasio, NJ PLS GS 02830700
Associate Vice President

# NGS Data Sheets

# The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1         National Geodetic Survey,   Retrieval Date = OCTOBER 27, 2010
 AG9916 ***********************************************************************
 AG9916  CBN         -  This is a Cooperative Base Network Control Station.
 AG9916  DESIGNATION -  12 W 3
 AG9916  PID         -  AG9916
 AG9916  STATE/COUNTY-  NJ/MIDDLESEX
 AG9916  USGS QUAD   -  PLAINFIELD (1995)
 AG9916
 AG9916                        *CURRENT SURVEY CONTROL
 AG9916  ___________________________________________________________________
 AG9916* NAD 83(2007)-  40 33 26.21313(N)    074 26 46.04499(W)     ADJUSTED
 AG9916* NAVD 88     -        25.191  (meters)      82.65   (feet) ADJUSTED
 AG9916  ___________________________________________________________________
 AG9916  EPOCH DATE  -        2002.00
 AG9916  X           -   1,301,223.091 (meters)                     COMP
 AG9916  Y           -  -4,674,983.910 (meters)                     COMP
 AG9916  Z           -   4,125,189.565 (meters)                     COMP
 AG9916  LAPLACE CORR-           5.05  (seconds)                    DEFLEC09
 AG9916  ELLIP HEIGHT-          -7.771 (meters)          (02/10/07) ADJUSTED
 AG9916  GEOID HEIGHT-         -32.96  (meters)                     GEOID09
 AG9916  DYNAMIC HT  -          25.180 (meters)      82.61   (feet) COMP
 AG9916
 AG9916  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 AG9916  Type    PID    Designation                        North   East  Ellip
 AG9916  -------------------------------------------------------------------
 AG9916  NETWORK AG9916 12 W 3                              0.31   0.24   0.84
 AG9916  -------------------------------------------------------------------
 AG9916  MODELED GRAV-     980,192.6   (mgal)                       NAVD 88
 AG9916
 AG9916  VERT ORDER  -  FIRST     CLASS II
 AG9916
 AG9916.The horizontal coordinates were established by GPS observations
 AG9916.and adjusted by the National Geodetic Survey in February 2007.
 AG9916
 AG9916.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 AG9916.See National Readjustment for more information.
 AG9916.The horizontal coordinates are valid at the epoch date displayed above.
 AG9916.The epoch date for horizontal control is a decimal equivalence
 AG9916.of Year/Month/Day.
 AG9916
 AG9916.The orthometric height was determined by differential leveling and
 AG9916.adjusted in March 2001.
 AG9916.No vertical observational check was made to the station.
 AG9916
 AG9916.Photographs are available for this station.
 AG9916
 AG9916.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 AG9916
 AG9916.The Laplace correction was computed from DEFLEC09 derived deflections.
 AG9916
 AG9916.The ellipsoidal height was determined by GPS observations
 AG9916.and is referenced to NAD 83.
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AG9916
AG9916.The geoid height was determined by GEOID09.
AG9916
AG9916.The dynamic height is computed by dividing the NAVD 88
AG9916.geopotential number by the normal gravity value computed on the
AG9916.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AG9916.degrees latitude (g = 980.6199 gals.).
AG9916
AG9916.The modeled gravity was interpolated from observed gravity values.
AG9916
AG9916;                    North         East     Units Scale Factor Converg.
AG9916;SPC NJ       -   191,390.141   154,562.638   MT  0.99990026   +0 02 06.1
AG9916;SPC NJ       -   627,919.15    507,094.25   sFT  0.99990026   +0 02 06.1
AG9916;UTM  18      - 4,489,760.366   546,892.255   MT  0.99962707   +0 21 36.5
AG9916
AG9916!             -  Elev Factor  x  Scale Factor =   Combined Factor
AG9916!SPC NJ       -   1.00000122  x   0.99990026  =   0.99990148
AG9916!UTM  18      -   1.00000122  x   0.99962707  =   0.99962829
AG9916
AG9916                          SUPERSEDED SURVEY CONTROL
AG9916
AG9916  ELLIP H (09/24/01)   -7.779  (m)                        GP(       ) 4 1
AG9916  NAD 83(1996)-  40 33 26.21328(N)    074 26 46.04552(W) AD(       ) B
AG9916  ELLIP H (08/14/98)   -7.763  (m)                        GP(       ) 3 2
AG9916  NAVD 88 (09/24/01)   25.19   (m)           82.6    (f) LEVELING    3
AG9916  NAVD 88 (08/14/98)   25.19   (m)           82.6    (f) LEVELING    3
AG9916
AG9916.Superseded values are not recommended for survey control.
AG9916.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AG9916.See file dsdata.txt to determine how the superseded data were derived.
AG9916
AG9916_U.S. NATIONAL GRID SPATIAL ADDRESS: 18TWK4689289760(NAD 83)
AG9916_MARKER: F = FLANGE-ENCASED ROD
AG9916_SETTING: 15 = METAL ROD DRIVEN INTO GROUND. SEE TEXT FOR ADDITIONAL
AG9916+WITH SETTING: INFORMATION.
AG9916_STAMPING: 12 W 3 1997
AG9916_MARK LOGO: NJGS
AG9916_PROJECTION: RECESSED 10 CENTIMETERS
AG9916_MAGNETIC: N = NO MAGNETIC MATERIAL
AG9916_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
AG9916_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AG9916+SATELLITE: SATELLITE OBSERVATIONS - July 31, 2008
AG9916_ROD/PIPE-DEPTH: 1.52 meters
AG9916_SLEEVE-DEPTH  : 0.90 meters
AG9916
AG9916  HISTORY     - Date     Condition        Report By
AG9916  HISTORY     - 1997     MONUMENTED       NJGS
AG9916  HISTORY     - 19970707 GOOD             NJGS
AG9916  HISTORY     - 20001003 GOOD             NJGS
AG9916  HISTORY     - 20001212 GOOD             TWT
AG9916  HISTORY     - 20020717 GOOD             NJGS
AG9916  HISTORY     - 20030403 GOOD             JCLS
AG9916  HISTORY     - 20050404 GOOD             JCLS
AG9916  HISTORY     - 20050405 GOOD             JCLS
AG9916  HISTORY     - 20050411 GOOD             NJGS
AG9916  HISTORY     - 20050816 GOOD             B2A
AG9916  HISTORY     - 20060508 GOOD             BOSWEL
AG9916  HISTORY     - 20080731 GOOD             INDIV
AG9916
AG9916                          STATION DESCRIPTION
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AG9916
AG9916'DESCRIBED BY NEW JERSEY GEODETIC SURVEY 1997 (RJK)
AG9916'THE STATION IS LOCATED IN PISCATAWAY TOWNSHIP ON STATE PROPERTY ABOUT
AG9916'2.5 MI (4.0 KM) SOUTHEAST FROM THE BOROUGH OF DUNELLEN, 4.0 MI (6.4
AG9916'KM) NORTHWEST FROM THE BOROUGH OF METUCHEN AND 2.5 MI (4.0 KM)
AG9916'SOUTHWEST FROM THE BOROUGH OF SOUTH PLAINFIELD ON THE NORTHWEST SIDE
AG9916'OF A LARGE TRIANGULAR SHAPED DRAINAGE DETENTION BASIN WITHIN A RAMP
AG9916'AREA AND ACCESS ROAD LEADING TO THE NORTHBOUND LANES OF INTERSTATE
AG9916'HIGHWAY 287 AND ABOUT 0.1 MI (0.2 KM) NORTH FROM THE BRIDGE CARRYING
AG9916'WASHINGTON AVENUE OVER INTERSTATE HIGHWAY 287.  TO REACH THE STATION
AG9916'FROM THE INTERSECTION OF STELTON ROAD, COUNTY ROAD 529 AND WASHINGTON
AG9916'AVENUE, GO SOUTH ON WASHINGTON AVENUE FOR 0.2 MI (0.3 KM) TO THE
AG9916'INTERSECTION WITH THE RAMP AND AN ACCESS ROAD AT A TRAFFIC LIGHT. TURN
AG9916'LEFT AND GO EAST ON THE ACCESS ROAD FOR ABOUT 87 FT (26.5 M) TO THE
AG9916'STATION ON THE RIGHT, SET FLUSH WITH THE GROUND ON THE NORTHWEST SIDE
AG9916'OF A LARGE TRIANGULAR SHAPED DRAINAGE RETENTION BASIN WITHIN A RAMP
AG9916'LEADING TO THE NORTHBOUND LANES OF INTERSTATE HIGHWAY 287 AND AN
AG9916'ACCESS ROAD LEADING EAST TO A LARGE CONCRETE AND GLASS OFFICE
AG9916'BUILDING, THE WASHINGTON PLAZA.  THE STATION IS A STANDARD NGS THREE
AG9916'DIMENSIONAL MARK.  THE LOGO FLANGE WITH ACCESS COVER IS STAMPED 12 W 3
AG9916'1997 AND IS SET FLUSH WITH THE GROUND.  THE STATION IS A NINE
AG9916'SIXTEENTHS INCH DIAMETER STAINLESS STEEL ROD WITH GREASE FILLED
AG9916'SLEEVE, DRIVEN TO REFUSAL AT A DEPTH OF 1.52 M (4.99 FT) AND IS
AG9916'RECESSED ABOUT 10 CM BELOW THE GROUND.  THE STATION IS 33.0 FT (10.1
AG9916'M) SOUTH SOUTHEAST FROM THE CENTERLINE OF A PAVED ACCESS ROAD LEADING
AG9916'EAST TO A LARGE CONCRETE AND GLASS OFFICE BUILDING, 59.75 FT (18.21 M)
AG9916'WEST FROM A CONCRETE FLARED END SECTION DRAINAGE PIPE ON THE WEST SIDE
AG9916'OF THE RAMP, 61.30 FT (18.68 M) EAST NORTHEAST FROM A CONCRETE FLARED
AG9916'END SECTION DRAINAGE PIPE ON THE EAST SIDE OF WASHINGTON AVENUE, 78.50
AG9916'FT (23.93 M) SOUTHEAST FROM POLE NUMBER 9771 PC ON THE NORTHWEST SIDE
AG9916'OF THE ACCESS ROAD, 81.50 FT (24.84 M) EAST FROM A TRAFFIC LIGHT POLE
AG9916'ON THE EAST SIDE OF WASHINGTON AVENUE, 87.0 FT (26.5 M) EAST FROM THE
AG9916'EAST CURB OF WASHINGTON AVENUE AND 12.50 FT (3.81 M) SOUTH SOUTHEAST
AG9916'FROM THE SOUTH CURB OF THE ACCESS ROAD.
AG9916
AG9916                          STATION RECOVERY (1997)
AG9916
AG9916'RECOVERY NOTE BY NEW JERSEY GEODETIC SURVEY 1997 (ECB)
AG9916'THE STATION IS LOCATED IN PISCATAWAY TOWNSHIP ON STATE PROPERTY ABOUT
AG9916'2.5 MI (4.0 KM) SOUTHEAST FROM THE BOROUGH OF DUNELLEN, 4.0 MI (6.4
AG9916'KM) NORTHWEST FROM THE BOROUGH OF METUCHEN AND 2.5 MI (4.0 KM)
AG9916'SOUTHWEST FROM THE BOROUGH OF SOUTH PLAINFIELD ON THE NORTHWEST SIDE
AG9916'OF A LARGE TRIANGULAR SHAPED DRAINAGE DETENTION BASIN WITHIN A RAMP
AG9916'AREA AND ACCESS ROAD LEADING TO THE NORTHBOUND LANES OF INTERSTATE
AG9916'HIGHWAY 287 AND ABOUT 0.1 MI (0.2 KM) NORTH FROM THE BRIDGE CARRYING
AG9916'WASHINGTON AVENUE OVER INTERSTATE HIGHWAY 287.  TO REACH THE STATION
AG9916'FROM THE INTERSECTION OF STELTON ROAD, COUNTY ROAD 529 AND WASHINGTON
AG9916'AVENUE, GO SOUTH ON WASHINGTON AVENUE FOR 0.2 MI (0.3 KM) TO THE
AG9916'INTERSECTION WITH THE RAMP AND AN ACCESS ROAD AT A TRAFFIC LIGHT. TURN
AG9916'LEFT AND GO EAST ON THE ACCESS ROAD FOR ABOUT 87 FT (26.5 M) TO THE
AG9916'STATION ON THE RIGHT, SET FLUSH WITH THE GROUND ON THE NORTHWEST SIDE
AG9916'OF A LARGE TRIANGULAR SHAPED DRAINAGE RETENTION BASIN WITHIN A RAMP
AG9916'LEADING TO THE NORTHBOUND LANES OF INTERSTATE HIGHWAY 287 AND AN
AG9916'ACCESS ROAD LEADING EAST TO A LARGE CONCRETE AND GLASS OFFICE
AG9916'BUILDING, THE WASHINGTON PLAZA.  THE STATION IS A STANDARD NGS THREE
AG9916'DIMENSIONAL MARK.  THE LOGO FLANGE WITH ACCESS COVER IS STAMPED 12 W 3
AG9916'1997 AND IS SET FLUSH WITH THE GROUND.  THE STATION IS A NINE
AG9916'SIXTEENTHS INCH DIAMETER STAINLESS STEEL ROD WITH GREASE FILLED
AG9916'SLEEVE, DRIVEN TO REFUSAL AT A DEPTH OF 1.52 M (4.99 FT) AND IS
AG9916'RECESSED ABOUT 10 CM BELOW THE GROUND.  THE STATION IS 33.0 FT (10.1
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AG9916'M) SOUTH SOUTHEAST FROM THE CENTERLINE OF A PAVED ACCESS ROAD LEADING
AG9916'EAST TO A LARGE CONCRETE AND GLASS OFFICE BUILDING, 59.75 FT (18.21 M)
AG9916'WEST FROM A CONCRETE FLARED END SECTION DRAINAGE PIPE ON THE WEST SIDE
AG9916'OF THE RAMP, 61.30 FT (18.68 M) EAST NORTHEAST FROM A CONCRETE FLARED
AG9916'END SECTION DRAINAGE PIPE ON THE EAST SIDE OF WASHINGTON AVENUE, 78.50
AG9916'FT (23.93 M) SOUTHEAST FROM POLE NUMBER 9771 PC ON THE NORTHWEST SIDE
AG9916'OF THE ACCESS ROAD, 81.50 FT (24.84 M) EAST FROM A TRAFFIC LIGHT POLE
AG9916'ON THE EAST SIDE OF WASHINGTON AVENUE, 87.0 FT (26.5 M) EAST FROM THE
AG9916'EAST CURB OF WASHINGTON AVENUE AND 12.50 FT (3.81 M) SOUTH SOUTHEAST
AG9916'FROM THE SOUTH CURB OF THE ACCESS ROAD.
AG9916
AG9916                          STATION RECOVERY (2000)
AG9916
AG9916'RECOVERY NOTE BY NEW JERSEY GEODETIC SURVEY 2000 (FGK)
AG9916'RECOVERED AS DESCRIBED.  ROD IS STAINLESS STEEL.
AG9916'
AG9916'
AG9916'
AG9916
AG9916                          STATION RECOVERY (2000)
AG9916
AG9916'RECOVERY NOTE BY TWT CONS ENG 2000 (DRF)
AG9916'RECOVERED IN GOOD CONDITION.
AG9916
AG9916                          STATION RECOVERY (2002)
AG9916
AG9916'RECOVERY NOTE BY NEW JERSEY GEODETIC SURVEY 2002 (EB)
AG9916'RECOVERED AS DESCRIBED.
AG9916'
AG9916'
AG9916
AG9916                          STATION RECOVERY (2003)
AG9916
AG9916'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2003
AG9916'RECOVERED IN GOOD CONDITION.
AG9916
AG9916                          STATION RECOVERY (2005)
AG9916
AG9916'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2005
AG9916'RECOVERED IN GOOD CONDITION.
AG9916
AG9916                          STATION RECOVERY (2005)
AG9916
AG9916'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2005 (MRY)
AG9916'RECOVERED IN GOOD CONDITION.
AG9916
AG9916                          STATION RECOVERY (2005)
AG9916
AG9916'RECOVERY NOTE BY NEW JERSEY GEODETIC SURVEY 2005 (SJM)
AG9916'RECOVERED AS DESCRIBED.
AG9916
AG9916                          STATION RECOVERY (2005)
AG9916
AG9916'RECOVERY NOTE BY B2A CONSULTANTS 2005 (ARD)
AG9916'RECOVERED AS DESCRIBED. (ARD)
AG9916
AG9916                          STATION RECOVERY (2006)
AG9916
AG9916'RECOVERY NOTE BY BOSWELL ENGINEERING 2006 (AB)
AG9916'RECOVERED IN GOOD CONDITION.
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AG9916
AG9916                          STATION RECOVERY (2008)
AG9916
AG9916'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2008 (GLB)
AG9916'THE MONUMENT WAS RECOVERED IN GOOD CONDITION.  SUBMITED BY GREG BURKE
AG9916'FROM ATLANTIS AERIAL SURVEY CO.

*** retrieval complete.
Elapsed Time = 00:00:00
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# The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1         National Geodetic Survey,   Retrieval Date = OCTOBER 27, 2010
 KV6524 ***********************************************************************
 KV6524  DESIGNATION -  27731
 KV6524  PID         -  KV6524
 KV6524  STATE/COUNTY-  NJ/SOMERSET
 KV6524  USGS QUAD   -  BOUND BROOK (1995)
 KV6524
 KV6524                          *CURRENT SURVEY CONTROL
 KV6524  ___________________________________________________________________
 KV6524* NAD 83(2007)-  40 35 06.08627(N)    074 30 29.41845(W)     ADJUSTED
 KV6524* NAVD 88     -        13.8    (meters)      45.     (feet)  VERTCON
 KV6524  ___________________________________________________________________
 KV6524  EPOCH DATE  -        2002.00
 KV6524  X           -  1,295,622.058 (meters)                     COMP
 KV6524  Y           -  -4,674,451.012 (meters)                    COMP
 KV6524  Z           -  4,127,522.134 (meters)                     COMP
 KV6524  LAPLACE CORR-          4.08  (seconds)                    DEFLEC09
 KV6524  ELLIP HEIGHT-        -19.321 (meters)          (02/10/07) ADJUSTED
 KV6524  GEOID HEIGHT-        -33.10  (meters)                     GEOID09
 KV6524
 KV6524  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 KV6524  Type    PID    Designation                      North   East  Ellip
 KV6524  -------------------------------------------------------------------
 KV6524  NETWORK KV6524 27731                              0.71   0.57   1.72
 KV6524  -------------------------------------------------------------------
 KV6524
 KV6524.The horizontal coordinates were established by GPS observations
 KV6524.and adjusted by the National Geodetic Survey in February 2007.
 KV6524
 KV6524.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 KV6524.See National Readjustment for more information.
 KV6524.The horizontal coordinates are valid at the epoch date displayed above.
 KV6524.The epoch date for horizontal control is a decimal equivalence
 KV6524.of Year/Month/Day.
 KV6524
 KV6524.The NAVD 88 height was computed by applying the VERTCON shift value to
 KV6524.the NGVD 29 height (displayed under SUPERSEDED SURVEY CONTROL.)
 KV6524
 KV6524.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 KV6524
 KV6524.The Laplace correction was computed from DEFLEC09 derived deflections.
 KV6524
 KV6524.The ellipsoidal height was determined by GPS observations
 KV6524.and is referenced to NAD 83.
 KV6524
 KV6524.The geoid height was determined by GEOID09.
 KV6524
 KV6524;                    North         East     Units Scale Factor Converg.
 KV6524;SPC NJ       -   194,469.158   149,308.240   MT  0.99990001   -0 00 19.1
 KV6524;SPC NJ       -   638,020.90    489,855.45   sFT  0.99990001   -0 00 19.1
 KV6524;UTM  18      - 4,492,808.669   541,621.921   MT  0.99962132   +0 19 11.9
 KV6524
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KV6524!              -  Elev Factor  x  Scale Factor =   Combined Factor
KV6524!SPC NJ        -   1.00000303  x   0.99990001  =   0.99990304
KV6524!UTM  18       -   1.00000303  x   0.99962132  =   0.99962435
KV6524
KV6524                          SUPERSEDED SURVEY CONTROL
KV6524
KV6524  ELLIP H (10/23/02)  -19.319  (m)                        GP(        ) 4 1
KV6524  NAD 83(1996)-  40 35 06.08649(N)    074 30 29.41863(W) AD(        ) 2
KV6524  ELLIP H (05/14/99)  -19.313  (m)                        GP(        ) 4 1
KV6524  NAD 83(1986)-  40 35 06.08718(N)    074 30 29.42073(W) AD(        ) 2
KV6524  NGVD 29 (10/04/91)   14.1    (m)           46.     (f) GPS OBS
KV6524
KV6524.Superseded values are not recommended for survey control.
KV6524.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
KV6524.See file dsdata.txt to determine how the superseded data were derived.
KV6524
KV6524_U.S. NATIONAL GRID SPATIAL ADDRESS: 18TWK4162192808(NAD 83)
KV6524_MARKER: DD = SURVEY DISK
KV6524_SETTING: 38 = SET IN THE ABUTMENT OR PIER OF A LARGE BRIDGE
KV6524_SP_SET: BRIDGE ABUTMENT
KV6524_STAMPING: 27731
KV6524_MARK LOGO: NJGS
KV6524_MAGNETIC: N = NO MAGNETIC MATERIAL
KV6524_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
KV6524_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR
KV6524+SATELLITE: SATELLITE OBSERVATIONS - May 03, 2009
KV6524
KV6524  HISTORY     - Date     Condition        Report By
KV6524  HISTORY     - 1982     MONUMENTED       NJGS
KV6524  HISTORY     - 19900124 GOOD             NJGS
KV6524  HISTORY     - 20050706 GOOD             INDIV
KV6524  HISTORY     - 20090503 GOOD             GEOCAC
KV6524
KV6524                          STATION DESCRIPTION
KV6524
KV6524'DESCRIBED BY NEW JERSEY GEODETIC SURVEY 1990
KV6524'THE STATION IS LOCATED IN GREEN BROOK TOWNSHIP, ON THE SOUTHWEST SIDE
KV6524'OF SERBINGS MILLS ROAD, IN THE NORTHWEST CORNER OF THE NORTH ABUTMENT
KV6524'OF THE BRIDGE OVER GREEN BROOK, THE SOMERSET, MIDDLESEX COUNTY LINE.
KV6524'TO REACH THE STATION FROM THE JUNCTION OF COUNTY ROAD 527, MOUNTAIN
KV6524'AVENUE, AND U.S. HIGHWAY 22 AT THE NORTHEAST CORNER OF BOUND BROOK
KV6524'BOROUGH, GO 1.6 KM (0.99 MI) NORTHEAST ON ROUTE 22 TO THE JUGHANDLE
KV6524'EXIT ONTO SERBINGS MILLS GREEN BROOK ROAD, TURN RIGHT AND GO 0.16 KM
KV6524'(0.10 MI) SOUTHEAST TO THE BRIDGE OVER GREEN BROOK AND THE STATION ON
KV6524'THE RIGHT.  IT IS 0.5 M (1.64 FT) WEST NORTHWEST OF THE NORTH END OF
KV6524'THE CONCRETE BRIDGE BALUSTRADE, 1.4 M (4.59 FT) SOUTH OF POLE 61540,
KV6524'2.4 M (7.87 FT) NORTHWEST OF THE CURBLINE AND 7.3 M (23.95 FT)
KV6524'NORTHWEST OF CENTERLINE OF THE ROAD.  THE STATION IS FLUSH WITH THE
KV6524'CONCRETE.
KV6524
KV6524                          STATION RECOVERY (2005)
KV6524
KV6524'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2005 (LUD)
KV6524'RECOVERED IN GOOD CONDITION.
KV6524
KV6524                          STATION RECOVERY (2009)
KV6524
KV6524'RECOVERY NOTE BY GEOCACHING 2009 (PR)
KV6524'RECOVERED IN GOOD CONDITION.
```

```
*** retrieval complete.
Elapsed Time = 00:00:00
```

# The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1         National Geodetic Survey,   Retrieval Date = OCTOBER 27, 2010
 KV6616 ***********************************************************************
 KV6616  DESIGNATION -  SC 200
 KV6616  PID         -  KV6616
 KV6616  STATE/COUNTY-  NJ/UNION
 KV6616  USGS QUAD   -  PLAINFIELD (1995)
 KV6616
 KV6616                        *CURRENT SURVEY CONTROL
 KV6616  ___________________________________________________________________
 KV6616* NAD 83(2007)-  40 35 55.60855(N)    074 27 17.22828(W)     ADJUSTED
 KV6616* NAVD 88     -        18.6    (meters)      61.      (feet)  GPS OBS
 KV6616  ___________________________________________________________________
 KV6616  EPOCH DATE  -        2002.00
 KV6616  X           -   1,299,711.608 (meters)                      COMP
 KV6616  Y           -  -4,672,287.791 (meters)                      COMP
 KV6616  Z           -   4,128,685.313 (meters)                      COMP
 KV6616  LAPLACE CORR-           4.11  (seconds)                    DEFLEC09
 KV6616  ELLIP HEIGHT-         -14.401 (meters)          (02/10/07) ADJUSTED
 KV6616  GEOID HEIGHT-         -32.99  (meters)                     GEOID09
 KV6616
 KV6616  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 KV6616  Type    PID    Designation                        North   East  Ellip
 KV6616  ___________________________________________________________________
 KV6616  NETWORK KV6616 SC 200                              1.14   0.78   2.61
 KV6616  ___________________________________________________________________
 KV6616
 KV6616.The horizontal coordinates were established by GPS observations
 KV6616.and adjusted by the National Geodetic Survey in February 2007.
 KV6616
 KV6616.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 KV6616.See National Readjustment for more information.
 KV6616.The horizontal coordinates are valid at the epoch date displayed above.
 KV6616.The epoch date for horizontal control is a decimal equivalence
 KV6616.of Year/Month/Day.
 KV6616
 KV6616.The orthometric height was determined by GPS observations and a
 KV6616.high-resolution geoid model.
 KV6616
 KV6616.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 KV6616
 KV6616.The Laplace correction was computed from DEFLEC09 derived deflections.
 KV6616
 KV6616.The ellipsoidal height was determined by GPS observations
 KV6616.and is referenced to NAD 83.
 KV6616
 KV6616.The geoid height was determined by GEOID09.
 KV6616
 KV6616;                     North         East     Units Scale Factor Converg.
 KV6616;SPC NJ       -   195,997.525   153,826.711   MT  0.99990018   +0 01 45.9
 KV6616;SPC NJ       -   643,035.21    504,679.80   sFT  0.99990018   +0 01 45.9
 KV6616;UTM  18      - 4,494,362.240   546,130.394   MT  0.99962619   +0 21 17.3
 KV6616
```

```
KV6616!                 -  Elev Factor  x  Scale Factor =   Combined Factor
KV6616!SPC NJ           -   1.00000226  x   0.99990018  =   0.99990244
KV6616!UTM  18          -   1.00000226  x   0.99962619  =   0.99962845
KV6616
KV6616:                    Primary Azimuth Mark                      Grid Az
KV6616:SPC NJ           -  SC 201                                    331 37 28.6
KV6616:UTM  18          -  SC 201                                    331 17 57.2
KV6616
KV6616|-----------------------------------------------------------------------|
KV6616| PID    Reference Object                          Distance      Geod. Az  |
KV6616|                                                                dddmmss.s |
KV6616| KV6617 SC 201                                  455.620 METERS 3313914.5 |
KV6616|-----------------------------------------------------------------------|
KV6616
KV6616                            SUPERSEDED SURVEY CONTROL
KV6616
KV6616  ELLIP H (10/23/02)  -14.405  (m)                          GP(        ) 4 1
KV6616  NAD 83(1996)-  40 35 55.60877(N)    074 27 17.22852(W) AD(        ) 2
KV6616  ELLIP H (05/14/99)  -14.393  (m)                          GP(        ) 4 1
KV6616  NAD 83(1996)-  40 35 55.60827(N)    074 27 17.22922(W) AD(        ) 2
KV6616  NAD 83(1986)-  40 35 55.60874(N)    074 27 17.23038(W) AD(        ) 2
KV6616  NGVD 29 (10/04/91)   18.9    (m)            62.      (f) GPS OBS
KV6616
KV6616.Superseded values are not recommended for survey control.
KV6616.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
KV6616.See file dsdata.txt to determine how the superseded data were derived.
KV6616
KV6616_U.S. NATIONAL GRID SPATIAL ADDRESS: 18TWK4613094362(NAD 83)
KV6616_MARKER: DD = SURVEY DISK
KV6616_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
KV6616_SP_SET: CONCRETE POST
KV6616_STAMPING: 200
KV6616_MARK LOGO: NJ-035
KV6616_PROJECTION: FLUSH
KV6616_MAGNETIC: N = NO MAGNETIC MATERIAL
KV6616_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
KV6616+STABILITY: SURFACE MOTION
KV6616_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
KV6616+SATELLITE: SATELLITE OBSERVATIONS - August 04, 2005
KV6616
KV6616  HISTORY     - Date     Condition        Report By
KV6616  HISTORY     - 1990     MONUMENTED       NJ-035
KV6616  HISTORY     - 20050804 GOOD             B2A
KV6616
KV6616                            STATION DESCRIPTION
KV6616
KV6616'DESCRIBED BY SOMERSET COUNTY NEW JERSEY 1990
KV6616'THE STATION IS LOCATED IN SOUTH PLAINFIELD BOROUGH, ON THE SOUTHWEST
KV6616'SIDE OF ROCK AVENUE.  TO REACH THE STATION FROM THE JUNCTION OF U.S.
KV6616'HIGHWAY 22 AND ROCK AVENUE, IN THE SOUTHWEST CORNER OF NORTH
KV6616'PLAINFIELD BOROUGH, GREEN BROOK TOWNSHIP, SOMERSET COUNTY, GO 1.44 KM
KV6616'(0.89 MI) SOUTHEAST ON ROCK AVENUE, CROSSING GREEN BROOK INTO SOUTH
KV6616'PLAINFIELD BOROUGH, TO A FACTORY DRIVEWAY, JUST SOUTHEAST OF MYRTLE
KV6616'AVENUE, AND THE STATION ON THE RIGHT.  TO REACH THE STATION FROM THE
KV6616'JUNCTION OF ROCK AVENUE AND WEST FRONT STREET, STATE ROUTE 28, IN
KV6616'SOUTH PLAINFIELD BOROUGH, GO 0.16 KM (0.10 MI) NORTHWEST ON ROCK
KV6616'AVENUE TO THE FACTORY DRIVE AND THE STATION ON THE LEFT.  IT IS 20.1
KV6616'M (65.94 FT) SOUTH SOUTHEAST OF UTILITY POLE 5082 PF, 5.3 M
KV6616'(17.39 FT) WEST SOUTHWEST OF THE ROCK AVENUE CENTERLINE, 3.1 M
KV6616'(10.17 FT) WEST NORTHWEST OF A GAS VALVE COVER IN ROCK AVENUE, 1.0 M
```

```
KV6616'(3.28 FT) WEST SOUTHWEST OF THE ROCK AVENUE CURBLINE AND 7.3 M
KV6616'(23.95 FT) SOUTH SOUTHEAST OF THE DRIVEWAY. THE STATION IS .05 M
KV6616'(0.16 FT) BELOW THE GROUND.  DESCRIPTION BY NJGS SRB.
KV6616
KV6616                          STATION RECOVERY (2005)
KV6616
KV6616'RECOVERY NOTE BY B2A CONSULTANTS 2005 (ARD)
KV6616'RECOVERED AS DESCRIBED.  (ARD)

*** retrieval complete.
Elapsed Time = 00:00:00
```

# The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = OCTOBER 27, 2010
 KV6805 ***********************************************************************
 KV6805  DESIGNATION -  12 N 3
 KV6805  PID         -  KV6805
 KV6805  STATE/COUNTY-  NJ/MIDDLESEX
 KV6805  USGS QUAD   -  PERTH AMBOY (1981)
 KV6805
 KV6805                         *CURRENT SURVEY CONTROL
 KV6805  ___________________________________________________________________
 KV6805* NAD 83(2007)-  40 35 04.92622(N)    074 21 17.72315(W)     ADJUSTED
 KV6805* NAVD 88     -        43.2    (meters)     142.     (feet)  GPS OBS
 KV6805  ___________________________________________________________________
 KV6805  EPOCH DATE  -        2002.00
 KV6805  X           -   1,308,132.506 (meters)                     COMP
 KV6805  Y           -  -4,671,013.073 (meters)                     COMP
 KV6805  Z           -   4,127,514.311 (meters)                     COMP
 KV6805  LAPLACE CORR-           5.22  (seconds)                    DEFLEC09
 KV6805  ELLIP HEIGHT-          10.425 (meters)          (02/10/07) ADJUSTED
 KV6805  GEOID HEIGHT-         -32.75  (meters)                     GEOID09
 KV6805
 KV6805  -------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 KV6805  Type     PID    Designation                       North   East  Ellip
 KV6805  -------------------------------------------------------------------
 KV6805  NETWORK KV6805 12 N 3                               0.27   0.24   0.55
 KV6805  -------------------------------------------------------------------
 KV6805
 KV6805.The horizontal coordinates were established by GPS observations
 KV6805.and adjusted by the National Geodetic Survey in February 2007.
 KV6805
 KV6805.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 KV6805.See National Readjustment for more information.
 KV6805.The horizontal coordinates are valid at the epoch date displayed above.
 KV6805.The epoch date for horizontal control is a decimal equivalence
 KV6805.of Year/Month/Day.
 KV6805
 KV6805.The orthometric height was determined by GPS observations and a
 KV6805.high-resolution geoid model.
 KV6805
 KV6805.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 KV6805
 KV6805.The Laplace correction was computed from DEFLEC09 derived deflections.
 KV6805
 KV6805.The ellipsoidal height was determined by GPS observations
 KV6805.and is referenced to NAD 83.
 KV6805
 KV6805.The geoid height was determined by GEOID09.
 KV6805
 KV6805;                     North         East     Units Scale Factor Converg.
 KV6805;SPC NJ       -   194,443.461   162,281.138   MT  0.99990186   +0 05 39.8
 KV6805;SPC NJ       -   637,936.59    532,417.37   sFT  0.99990186   +0 05 39.8
 KV6805;UTM  18      - 4,492,856.613   554,591.227   MT  0.99963668   +0 25 10.8
 KV6805
```

```
KV6805!                 -  Elev Factor  x  Scale Factor =   Combined Factor
KV6805!SPC NJ           -   0.99999836  x   0.99990186  =   0.99990022
KV6805!UTM  18          -   0.99999836  x   0.99963668  =   0.99963505
KV6805
KV6805                              SUPERSEDED SURVEY CONTROL
KV6805
KV6805  ELLIP H (10/23/02)    10.423  (m)                        GP(        ) 4 1
KV6805  NAD 83(1996)-  40 35 04.92642(N)     074 21 17.72336(W) AD(        ) 1
KV6805  ELLIP H (05/14/99)    10.430  (m)                        GP(        ) 4 1
KV6805  NAD 83(1996)-  40 35 04.92606(N)     074 21 17.72383(W) AD(        ) 1
KV6805  NAD 83(1992)-  40 35 04.92498(N)     074 21 17.72338(W) AD(        ) 1
KV6805  ELLIP H (04/25/94)    10.366  (m)                        GP(        ) 3 1
KV6805  NAD 83(1986)-  40 35 04.92555(N)     074 21 17.72525(W) AD(        ) 1
KV6805
KV6805.Superseded values are not recommended for survey control.
KV6805.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
KV6805.See file dsdata.txt to determine how the superseded data were derived.
KV6805
KV6805_U.S. NATIONAL GRID SPATIAL ADDRESS: 18TWK5459192856(NAD 83)
KV6805_MARKER: DD = SURVEY DISK
KV6805_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
KV6805_SP_SET: CONCRETE POST
KV6805_STAMPING: 12 N 3 1992
KV6805_MARK LOGO: NJGS
KV6805_MAGNETIC: N = NO MAGNETIC MATERIAL
KV6805_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
KV6805+STABILITY: SURFACE MOTION
KV6805_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
KV6805+SATELLITE: SATELLITE OBSERVATIONS - July 08, 2004
KV6805
KV6805  HISTORY     - Date     Condition        Report By
KV6805  HISTORY     - 1992     MONUMENTED       NJGS
KV6805  HISTORY     - 19930322 GOOD             NJHA
KV6805  HISTORY     - 20040708 GOOD             GEOCAC
KV6805
KV6805                              STATION DESCRIPTION
KV6805
KV6805'DESCRIBED BY NEW JERSEY GEODETIC SURVEY 1992
KV6805'THE STATION IS LOCATED IN EDISON TOWNSHIP ON THE NORTH SIDE OF NEW
KV6805'DOVER ROAD ALONG THE EXIT DRIVEWAY LEADING FROM THE JAMES MADISON
KV6805'PRIMARY SCHOOL NUMBER 20 AND THE JAMES MADISON INTERMEDIATE SCHOOL
KV6805'NUMBER 10 AND BEHIND THE EDISON TOWNSHIP FIRST AID SQUAD NUMBER 2,
KV6805'848 NEW DOVER ROAD.  TO REACH THE STATION FROM THE INTERSECTION OF
KV6805'NEW DOVER ROAD BRIDGE AND THE GARDEN STATE PARKWAY, WHICH IS ABOUT
KV6805'1.0 MI NORTH OF INTERCHANGE 131, GO WEST ON NEW DOVER ROAD FOR 1.5 MI
KV6805'(2.4 KM) TO THE STATION ON THE RIGHT, BEHIND THE ONE STORY GRAY
KV6805'PAINTED BLOCK RESCUE SQUAD BUILDING.  THE STATION IS 0.7 M (2.3 FT)
KV6805'WEST FROM THE WEST CURB OF THE EXIT DRIVE, 0.6 M (2.0 FT) EAST FROM
KV6805'THE EAST EDGE OF THE SIDEWALK, 7.2 M (23.6 FT) EAST FROM THE EAST
KV6805'EDGE OF THE RESCUE SQUAD PARKING LOT, 24.9 M (81.7 FT) NORTHEAST FROM
KV6805'THE NORTHEAST CORNER OF THE RESCUE SQUAD BUILDING AND 28.6 M
KV6805'(93.8 FT) SOUTH FROM THE NORTHEAST CORNER OF THE PARKING LOT.
KV6805
KV6805                              STATION RECOVERY (1993)
KV6805
KV6805'RECOVERY NOTE BY NEW JERSEY HIGHWAY AUTHORITY 1993
KV6805'RECOVERED IN GOOD CONDITION.
KV6805
KV6805                              STATION RECOVERY (2004)
KV6805
```

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KV6805'RECOVERY NOTE BY GEOCACHING 2004 (WD)
KV6805'THE SCHOOL DRIVEWAY IS NOW NAMED WEINFELD DRIVE.

*** retrieval complete.
Elapsed Time = 00:00:00
```

# The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1         National Geodetic Survey,   Retrieval Date = OCTOBER 27, 2010
 KV6826 ***********************************************************************
 KV6826  DESIGNATION -  20 G 1
 KV6826  PID         -  KV6826
 KV6826  STATE/COUNTY-  NJ/UNION
 KV6826  USGS QUAD   -  PERTH AMBOY (1981)
 KV6826
 KV6826                        *CURRENT SURVEY CONTROL
 KV6826  ___________________________________________________________________
 KV6826* NAD 83(2007)-  40 36 40.44220(N)    074 22 23.83896(W)     ADJUSTED
 KV6826* NAVD 88     -        37.4    (meters)     123.     (feet)  GPS OBS
 KV6826  ___________________________________________________________________
 KV6826  EPOCH DATE  -        2002.00
 KV6826  X           -   1,306,117.552 (meters)                     COMP
 KV6826  Y           -  -4,669,581.467 (meters)                     COMP
 KV6826  Z           -   4,129,747.648 (meters)                     COMP
 KV6826  LAPLACE CORR-           4.89  (seconds)                    DEFLEC09
 KV6826  ELLIP HEIGHT-           4.623 (meters)          (02/10/07) ADJUSTED
 KV6826  GEOID HEIGHT-         -32.81  (meters)                     GEOID09
 KV6826
 KV6826  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 KV6826  Type    PID    Designation                     North   East  Ellip
 KV6826  -------------------------------------------------------------------
 KV6826  NETWORK KV6826 20 G 1                           0.25   0.24   0.55
 KV6826  -------------------------------------------------------------------
 KV6826
 KV6826.The horizontal coordinates were established by GPS observations
 KV6826.and adjusted by the National Geodetic Survey in February 2007.
 KV6826
 KV6826.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 KV6826.See National Readjustment for more information.
 KV6826.The horizontal coordinates are valid at the epoch date displayed above.
 KV6826.The epoch date for horizontal control is a decimal equivalence
 KV6826.of Year/Month/Day.
 KV6826
 KV6826.The orthometric height was determined by GPS observations and a
 KV6826.high-resolution geoid model.
 KV6826
 KV6826.Photographs are available for this station.
 KV6826
 KV6826.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 KV6826
 KV6826.The Laplace correction was computed from DEFLEC09 derived deflections.
 KV6826
 KV6826.The ellipsoidal height was determined by GPS observations
 KV6826.and is referenced to NAD 83.
 KV6826
 KV6826.The geoid height was determined by GEOID09.
 KV6826
 KV6826;                    North         East     Units Scale Factor Converg.
 KV6826;SPC NJ       -   197,387.069   160,722.210   MT  0.99990141   +0 04 56.9
 KV6826;SPC NJ       -   647,594.08    527,302.78   sFT  0.99990141   +0 04 56.9
```

```
KV6826;UTM  18       - 4,495,790.540   553,016.027   MT  0.99963460   +0 24 28.6
KV6826
KV6826!              -  Elev Factor  x  Scale Factor =   Combined Factor
KV6826!SPC NJ        -   0.99999927  x   0.99990141  =   0.99990068
KV6826!UTM  18       -   0.99999927  x   0.99963460  =   0.99963388
KV6826
KV6826                          SUPERSEDED SURVEY CONTROL
KV6826
KV6826  ELLIP H (10/23/02)    4.620  (m)                        GP(        ) 4 1
KV6826  NAD 83(1996)-  40 36 40.44239(N)    074 22 23.83917(W) AD(        ) 1
KV6826  ELLIP H (05/14/99)    4.628  (m)                        GP(        ) 4 1
KV6826  NAD 83(1996)-  40 36 40.44202(N)    074 22 23.83964(W) AD(        ) 1
KV6826  NAD 83(1992)-  40 36 40.44088(N)    074 22 23.83921(W) AD(        ) 1
KV6826  ELLIP H (04/25/94)    4.568  (m)                        GP(        ) 3 1
KV6826  NAD 83(1986)-  40 36 40.44187(N)    074 22 23.84129(W) AD(        ) 1
KV6826
KV6826.Superseded values are not recommended for survey control.
KV6826.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
KV6826.See file dsdata.txt to determine how the superseded data were derived.
KV6826
KV6826_U.S. NATIONAL GRID SPATIAL ADDRESS: 18TWK5301695790(NAD 83)
KV6826_MARKER: DD = SURVEY DISK
KV6826_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
KV6826_SP_SET: CONCRETE POST
KV6826_STAMPING: 20 G 1 1992
KV6826_MARK LOGO: NJGS
KV6826_MAGNETIC: N = NO MAGNETIC MATERIAL
KV6826_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
KV6826+STABILITY: SURFACE MOTION
KV6826_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
KV6826+SATELLITE: SATELLITE OBSERVATIONS - March 22, 1993
KV6826
KV6826  HISTORY      - Date     Condition        Report By
KV6826  HISTORY      - 1992     MONUMENTED       NJGS
KV6826  HISTORY      - 19930322 GOOD             NJHA
KV6826  HISTORY      - 20070603 GOOD             GEOCAC
KV6826
KV6826                          STATION DESCRIPTION
KV6826
KV6826'DESCRIBED BY NEW JERSEY GEODETIC SURVEY 1992
KV6826'THE STATION IS LOCATED IN CLARK TOWNSHIP ON THE SOUTHEAST SIDE OF
KV6826'RARITAN ROAD ON THE GROUNDS OF THE ASHBROOK GOLF COURSE, PART OF THE
KV6826'UNION COUNTY PARK SYSTEM. TO REACH THE STATION FROM THE INTERSECTION
KV6826'OF CENTRAL AVENUE AND THE GARDEN STATE PARKWAY AT INTERCHANGE 135, GO
KV6826'WEST ON CENTRAL AVENUE FOR 0.4 MI (0.6 KM) TO THE INTERSECTION WITH
KV6826'OLD RARITAN ROAD ON THE LEFT. TURN LEFT AND GO SOUTHWEST FOR 1.8 MI
KV6826'(2.9 KM) ON OLD RARITAN ROAD, CROSSING A LAKE, TO A FORK JUNCTION
KV6826'WITH OAK RIDGE ROAD.  TAKE THE RIGHT FORK AND GO 0.2 MI (0.3 KM) ON
KV6826'OAK RIDGE ROAD TO THE INTERSECTION WITH LAKE AVENUE. TURN RIGHT AND
KV6826'GO 0.6 MI (1.0 KM) TO THE FORK JUNCTION WITH MARTINE AVENUE, BEAR TO
KV6826'THE LEFT AND GO 0.85 MI (1.37 KM) ON MARTINE AVENUE TO THE
KV6826'INTERSECTION WITH RARITAN ROAD. TURN LEFT AND GO 0.75 MI (1.21 KM) TO
KV6826'A LEFT TURN AT THE GOLF COURSE AND THE JUNCTION WITH TERRIL ROAD ON
KV6826'THE RIGHT, TURN LEFT AND CONTINUE ON RARITAN ROAD FOR 0.6 MI
KV6826'(1.0 KM) TO THE DRIVEWAY AT THE ENTRANCE TO THE ASHBROOK GOLF COURSE
KV6826'AND THE STATION ON THE LEFT. THE STATION IS SET FLUSH WITH THE GROUND
KV6826'IN THE CENTER OF A GRASS ISLAND AT THE ENTRANCE TO THE ASHBROOK GOLF
KV6826'COURSE. THE STATION IS 13.1 M (43.0 FT) NORTWEST FROM THE NORTH
KV6826'CORNER OF THE BATTLE OF SHORT HILLS MONUMENT AT THE NORTHWEST END OF
KV6826'THE PARKING LOT, 36.0 M (118.1 FT) SOUTHEAST FROM THE CENTERLINE OF
```

# Loops and Misclosures

Leica Geosystems

# Loops and Misclosures

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Created: 10/27/2010 11:50:51

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NJ NAD83 (GRS80) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | MOVE3 4.0.1 |
| Critical value W-test is: | 1.96 |
| Dimension: | 3D |

## GPS Baseline Loops

### Loop 1

| From | To | dX[fts] | dY[fts] | dZ[fts] |
|---|---|---|---|---|
| 0005 | AG9916 | 9763.5440 | -3131.5376 | -6525.5907 |
| AG9916 | 0006 | -4362.2213 | 3427.0595 | 5188.3206 |
| 0006 | kv6616 | -596.7242 | 5418.3783 | 6280.6732 |
| kv6616 | 0005 | -4804.6301 | -5713.8514 | -4943.4210 |

| | | | |
|---|---|---|---|
| X: | -0.0315 fts | W-Test: | -1.38 |
| Y: | 0.0488 fts | | 1.38 |
| Z: | -0.0179 fts | | -0.52 |
| Easting: | -0.0173 fts | W-Test: | -0.72 |
| Northing: | 0.0225 fts | | 0.65 |
| Height: | -0.0538 fts | | -1.56 |
| Closing error: | 0.0608 fts | (1.6 ppm) | Ratio:(1:608640) |
| Length: | 37019.5479 fts | | |

### Loop 2

| From | To | dX[fts] | dY[fts] | dZ[fts] |
|---|---|---|---|---|
| 0006 | AG9916 | 4362.2213 | -3427.0595 | -5188.3206 |
| AG9916 | 0004 | -12493.4827 | 1503.4639 | 5536.0846 |
| 0004 | kv6616 | 7534.5552 | 7341.9770 | 5932.8994 |
| kv6616 | 0006 | 596.7242 | -5418.3783 | -6280.6732 |

| | | | |
|---|---|---|---|
| X: | 0.0180 fts | W-Test: | 0.89 |
| Y: | 0.0032 fts | | 0.08 |

| | | | |
|---|---|---|---|
| Z: | -0.0098 fts | | -0.22 |
| Easting: | 0.0182 fts | W-Test: | 0.83 |
| Northing: | -0.0086 fts | | -0.21 |
| Height: | -0.0050 fts | | -0.12 |
| Closing error: | 0.0207 fts | (0.5 ppm) | Ratio: (1:2015972) |
| Length: | 41737.2853 fts | | |

Loop 3

| From | To | dX[fts] | dY[fts] | dZ[fts] |
|---|---|---|---|---|
| 0006 | AG9916 | 4362.2213 | -3427.0595 | -5188.3206 |
| AG9916 | 0003 | -13578.1118 | 1434.2566 | 5789.0579 |
| 0003 | kv6616 | 8619.1790 | 7411.1705 | 5679.9152 |
| kv6616 | 0006 | 596.7242 | -5418.3783 | -6280.6732 |

| | | | |
|---|---|---|---|
| X: | 0.0126 fts | W-Test: | 0.74 |
| Y: | -0.0107 fts | | -0.31 |
| Z: | -0.0206 fts | | -0.56 |
| Easting: | 0.0093 fts | W-Test: | 0.50 |
| Northing: | -0.0246 fts | | -0.70 |
| Height: | -0.0031 fts | | -0.09 |
| Closing error: | 0.0265 fts | (0.6 ppm) | Ratio: (1:1642547) |
| Length: | 43449.4896 fts | | |

Loop 4

| From | To | dX[fts] | dY[fts] | dZ[fts] |
|---|---|---|---|---|
| 0001 | AG9916 | 17211.5262 | -1803.2274 | -7346.2123 |
| AG9916 | 0002 | -15782.3602 | 1433.0927 | 6481.3180 |
| 0002 | kv6524 | -2593.6832 | 315.2337 | 1171.4843 |
| kv6524 | 0001 | 1164.5202 | 54.9125 | -306.5965 |

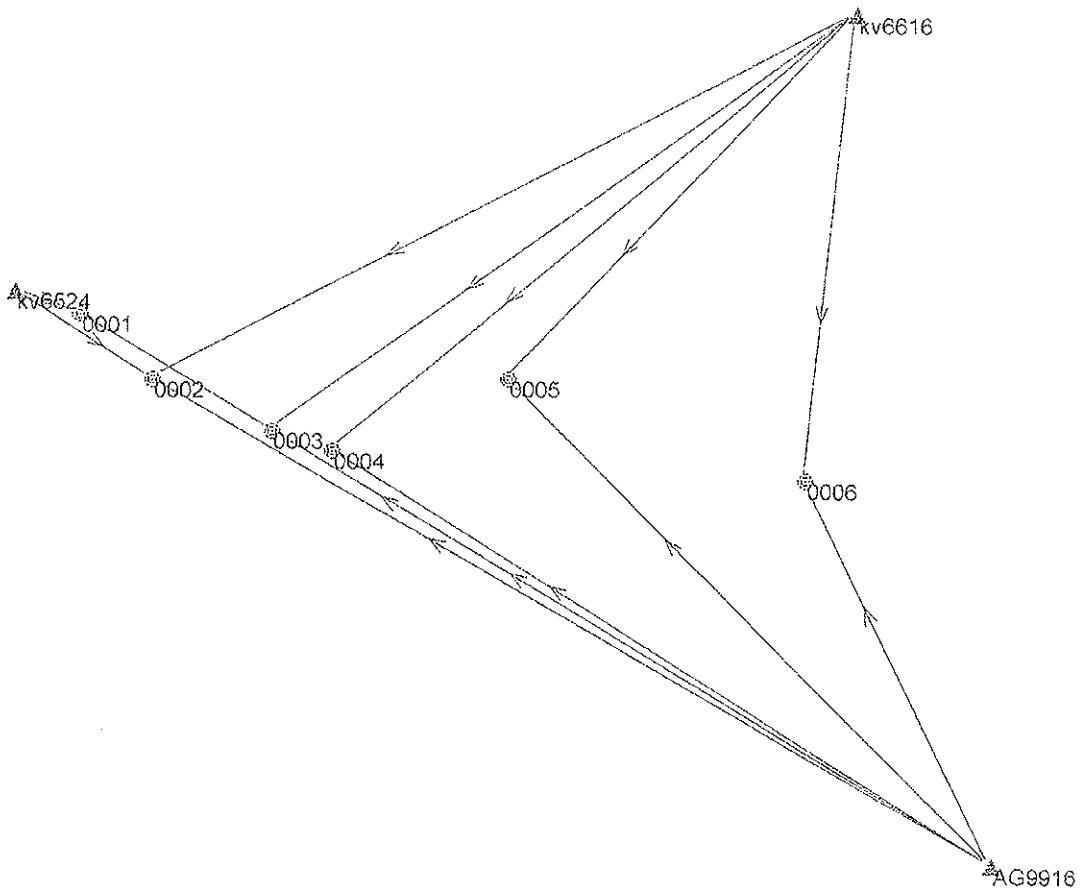
| | | | |
|---|---|---|---|
| X: | 0.0030 fts | W-Test: | 0.12 |
| Y: | 0.0116 fts | | 0.28 |
| Z: | -0.0066 fts | | -0.19 |
| Easting: | 0.0060 fts | W-Test: | 0.23 |
| Northing: | 0.0018 fts | | 0.05 |
| Height: | -0.0121 fts | | -0.32 |
| Closing error: | 0.0136 fts | (0.3 ppm) | Ratio: (1:2930544) |
| Length: | 39990.6890 fts | | |

Loop 5

| From | To | dX[fts] | dY[fts] | dZ[fts] |
|---|---|---|---|---|
| 0006 | AG9916 | 4362.2213 | -3427.0595 | -5188.3206 |
| AG9916 | 0002 | -15782.3602 | 1433.0927 | 6481.3180 |
| 0002 | kv6616 | 10823.4444 | 7412.3939 | 4987.6745 |
| kv6616 | 0006 | 596.7242 | -5418.3783 | -6280.6732 |

| | | | |
|---|---|---|---|
| X: | 0.0296 fts | W-Test: | 1.81 |

| | | | | |
|---|---|---|---|---|
| Y: | 0.0489 fts | | 1.62 | |
| Z: | -0.0013 fts | | -0.05 | |
| Easting: | 0.0416 fts | W-Test: | 2.35 | ⚠ |
| Northing: | 0.0245 fts | | 0.92 | |
| Height: | -0.0306 fts | | -1.12 | |
| Closing error: | 0.0572 fts | (1.2 ppm) | Ratio:(1:823450) | |
| Length: | 47067.8658 fts | | | |




6561.666667 fts

+ Estimated
Navigated
SPP
Measured
Average
Reference
Adjusted
Control - 1D
Control - 2D
Control - 3D

10/27/2010 11:52:19

Points of Project: gps101310 (Coordinate System: NJ NAD83 (GRS80), Units: fts)

| Point Id | Date/Time | Northing | Easting | Ortho. Hgt. | Code | Posn. Qlty | Posn. + Hgt. Qlty |
|---|---|---|---|---|---|---|---|
| AG9916 | 10/13/2010 08:12:50 | 627919.1536 | 507094.2569 | 82.6556 | | 2.2111 | 4.2399 |
| 0001 | 10/13/2010 08:56:09 | 637620.0571 | 490992.1837 | 41.8202 | | 0.0030 | 0.0264 |
| kv6524 | 10/13/2010 08:56:09 | 638020.8938 | 489855.4524 | 45.2160 | | 4.9767 | 9.4395 |
| 0002 | 10/13/2010 10:19:47 | 636482.8161 | 492270.3326 | 40.0713 | | 0.0029 | 0.0146 |
| kv6616 | 10/13/2010 10:19:47 | 643035.2136 | 504679.7990 | 60.9889 | | 3.3943 | 6.5925 |
| 0003 | 10/13/2010 10:55:25 | 635574.7166 | 494394.5473 | 36.3322 | | 0.0227 | 0.0343 |
| 0004 | 10/13/2010 11:17:45 | 635237.4345 | 495458.1141 | 41.3920 | | 0.0142 | 0.0268 |
| 0005 | 10/13/2010 11:48:55 | 636534.8325 | 498523.5519 | 48.1763 | | 0.0185 | 0.0468 |
| 0006 | 10/13/2010 12:19:35 | 634765.6039 | 503806.8922 | 60.5198 | | 0.0232 | 0.0403 |

# Loops and Misclosures

**www.MOVE3.com**

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Created: 02/21/2011 12:06:20

## Project Information

| | |
|---|---|
| Project name: | gpsboundbrook101410 |
| Date created: | 02/21/2011 11:48:56 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | MOVE3 4.0.1 |
| Critical value W-test is: | 1.96 |
| Dimension: | 3D |

## GPS Baseline Loops

### Loop 1

| From | To | dX[m] | dY[m] | dZ[m] |
|---|---|---|---|---|
| 0007 | AG 9916 | 599.9431 | -1380.9136 | -1728.8925 |
| AG 9916 | 0008 | 785.4906 | 2125.9245 | 2135.4070 |
| 0008 | kv6805 | 6123.9462 | 1844.8375 | 189.4349 |
| kv6805 | 0007 | -7509.3554 | -2589.9176 | -595.8751 |

| | | | | |
|---|---|---|---|---|
| X: | 0.0245 m | W-Test: | 0.32 | |
| Y: | -0.0692 m | | -2.97 | ⚠ |
| Z: | 0.0742 m | | 2.78 | ⚠ |
| Easting: | 0.0050 m | W-Test: | 0.07 | |
| Northing: | 0.0087 m | | 0.31 | |
| Height: | 0.1040 m | | 3.60 | ⚠ |
| Closing error: | 0.1044 m | (5.3 ppm) | Ratio:(1:189303) | |
| Length: | 19770.8476 m | | | |

### Loop 2

| From | To | dX[m] | dY[m] | dZ[m] |
|---|---|---|---|---|
| 0009 | AG 9916 | -2347.9113 | -2275.6427 | -1816.9025 |
| AG 9916 | 0010 | 2911.0605 | 2015.0953 | 1347.4895 |
| 0010 | kv6826 | 1983.3990 | 3387.3393 | 3210.6018 |
| kv6826 | 0009 | -2546.5429 | -3126.7995 | -2741.1804 |

| | | | |
|---|---|---|---|
| X: | 0.0052 m | W-Test: | 0.60 |
| Y: | -0.0077 m | | -0.54 |

| | | | |
|---|---|---|---|
| Z: | 0.0085 m | | 0.62 |
| Easting: | 0.0029 m | W-Test: | 0.32 |
| Northing: | 0.0008 m | | 0.05 |
| Height: | 0.0122 m | | 0.89 |
| Closing error: | 0.0126 m | (0.7 ppm) | Ratio: (1:1388715) |
| Length: | 17475.9890 m | | |

**Loop 3**

| From | To | dX[m] | dY[m] | dZ[m] |
|---|---|---|---|---|
| 0010 | AG 9916 | -2911.0605 | -2015.0953 | -1347.4895 |
| AG 9916 | 0008 | 785.4906 | 2125.9245 | 2135.4070 |
| 0008 | kv6826 | 4108.9562 | 3276.5323 | 2422.6825 |
| kv6826 | 0010 | -1983.3990 | -3387.3393 | -3210.6018 |

| | | | |
|---|---|---|---|
| X: | -0.0127 m | W-Test: | -1.81 |
| Y: | 0.0222 m | | 1.79 |
| Z: | -0.0019 m | | -0.12 |
| Easting: | -0.0062 m | W-Test: | -0.83 |
| Northing: | 0.0147 m | | 1.04 |
| Height: | -0.0200 m | | -1.47 |
| Closing error: | 0.0256 m | (1.4 ppm) | Ratio:(1:692864) |
| Length: | 17760.1589 m | | |

Points of Project: gpsboundbrook101410 (Coordinate System: NJ NAD83 (GRS80), Units: m)

| Point Id | Date/Time | Northing | Easting | Ortho. Hgt. | Code |
|---|---|---|---|---|---|
| kv6805 | 10/14/2010 09:13:16 | 194443.4614 | 162281.1382 | 43.1752 | |
| kv6826 | 10/14/2010 10:52:51 | 197387.0699 | 160722.2104 | 37.4290 | |
| AG 9916 | 10/14/2010 08:45:55 | 191390.1408 | 154562.6386 | 25.1935 | |
| 0010 | 10/14/2010 12:49:51 | 193170.4804 | 157906.0178 | 20.4946 | |
| 0009 | 10/14/2010 11:24:25 | 193788.1628 | 157433.0268 | 20.2922 | |
| 0006 | 10/14/2010 08:54:03 | 193476.9430 | 153560.6479 | 18.4465 | |
| 0008 | 10/14/2010 10:52:51 | 194207.7769 | 155887.5728 | 18.3797 | |
| 0007 | 10/14/2010 09:42:45 | 193672.9169 | 154353.5780 | 16.7857 | |
| kv6524 | 10/14/2010 12:28:06 | 194469.1574 | 149308.2405 | 13.7819 | |
| 1 | 10/14/2010 12:49:51 | 194346.9821 | 149654.7169 | 12.7468 | |

# Results – Baseline

Leica Geosystems

# Results - Baseline
# kv6524 - 0001

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:31 |

## Point Information

| | Reference: kv6524 | Rover: 0001 |
|---|---|---|
| Receiver type / S/N: | GX1230 / 457691 | GX1230GG / 350414 |
| Antenna type / S/N: | AX1202 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.2790 m | 1.2940 m |
| Initial coordinates: | | |
| Latitude: | 40° 35' 06.08626" N | 40° 35' 02.18684" N |
| Longitude: | 74° 30' 29.41843" W | 74° 30' 14.69549" W |
| Ellip. Hgt: | -19.3214 m | -19.7573 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 2 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | None | Switched to using no ionospheric model. For one or more Computed ionospheric models derived from the reference station kv6524 the time span of usable data is too short - these models are not used. |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:kv6524 | Rover:0001 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 06.08626" N | 40° 35' 02.12581" N |
| Longitude: | 74° 30' 29.41843" W | 74° 30' 14.68360" W |
| Ellip. Hgt: | -19.3214 m | -20.3569 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| | | | |
|---|---|---|---|
| Quality: | Sd. Lat: 0.0004 m | Sd. Lon: 0.0003 m | Sd. Hgt: 0.0008 m |
| | Posn. Qlty: 0.0005 m | Sd. Slope: 0.0004 m | |

Leica Geosystems

# Results - Baseline
# AG9916 - 0001

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:32 |

## Point Information

| | Reference: AG9916 | Rover: 0001 |
|---|---|---|
| Receiver type / S/N: | SR530 / 38743 | GX1230GG / 350414 |
| Antenna type / S/N: | AT502 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.1530 m | 1.2940 m |
| Initial coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 35' 02.18684" N |
| Longitude: | 74° 26' 46.04498" W | 74° 30' 14.69549" W |
| Ellip. Hgt: | -7.7705 m | -19.7573 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 10 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:AG9916 | Rover:0001 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 35' 02.12587" N |
| Longitude: | 74° 26' 46.04498" W | 74° 30' 14.68360" W |
| Ellip. Hgt: | -7.7705 m | -20.3409 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| | | | |
|---|---|---|---|
| Quality: | Sd. Lat: 0.0003 m | Sd. Lon: 0.0003 m | Sd. Hgt: 0.0008 m |
| | Posn. Qlty: 0.0005 m | Sd. Slope: 0.0004 m | |

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# Results - Baseline
# kv6524 - 0002

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:32 |

## Point Information

| | Reference: kv6524 | Rover: 0002 |
|---|---|---|
| Receiver type / S/N: | GX1230 / 457691 | GX1230GG / 350414 |
| Antenna type / S/N: | AX1202 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.2790 m | 1.0970 m |
| Initial coordinates: | | |
| Latitude: | 40° 35' 06.08626" N | 40° 34' 50.92710" N |
| Longitude: | 74° 30' 29.41843" W | 74° 29' 58.12083" W |
| Ellip. Hgt: | -19.3214 m | -23.8483 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 2 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | None | Switched to using no ionospheric model. For one or more Computed ionospheric models derived from the reference station kv6524 the time span of usable data is too short - these models are not used. |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:kv6524 | Rover:0002 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 06.08626" N | 40° 34' 50.88744" N |
| Longitude: | 74° 30' 29.41843" W | 74° 29' 58.11634" W |
| Ellip. Hgt: | -19.3214 m | -20.8812 m |

| | | | |
|---|---|---|---|
| Solution type: | Phase: all fix | | |
| GNSS type: | GPS | | |
| Frequency: | L1 and L2 | | |
| Ambiguity: | Yes | | |
| Quality: | Sd. Lat: 0.0004 m | Sd. Lon: 0.0004 m | Sd. Hgt: 0.0009 m |
| | Posn. Qlty: 0.0006 m | Sd. Slope: 0.0004 m | |

Leica Geosystems

# Results - Baseline
# kv6616 - 0002

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:32 |

## Point Information

| | Reference: kv6616 | Rover: 0002 |
|---|---|---|
| Receiver type / S/N: | GX1230 / 457691 | GX1230GG / 350414 |
| Antenna type / S/N: | AX1202 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.2130 m | 1.0970 m |
| Initial coordinates: | | |
| Latitude: | 40° 35' 55.60854" N | 40° 34' 50.92710" N |
| Longitude: | 74° 27' 17.22829" W | 74° 29' 58.12083" W |
| Ellip. Hgt: | -14.4010 m | -23.8483 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 2 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS sateilites (Slot Id): | None |

## Final Coordinates

| | Reference:kv6616 | Rover:0002 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 55.60854" N | 40° 34' 50.88753" N |
| Longitude: | 74° 27' 17.22829" W | 74° 29' 58.11626" W |
| Ellip. Hgt: | -14.4010 m | -20.8813 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| | | | |
|---|---|---|---|
| Quality: | Sd. Lat: 0.0003 m | Sd. Lon: 0.0003 m | Sd. Hgt: 0.0008 m |
| | Posn. Qlty: 0.0004 m | Sd. Slope: 0.0003 m | |

Leica Geosystems

# Results - Baseline
# AG9916 - 0002

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:32 |

## Point Information

| | Reference: AG9916 | Rover: 0002 |
|---|---|---|
| Receiver type / S/N: | SR530 / 38743 | GX1230GG / 350414 |
| Antenna type / S/N: | AT502 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.1530 m | 1.0970 m |
| Initial coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 50.92710" N |
| Longitude: | 74° 26' 46.04498" W | 74° 29' 58.12083" W |
| Ellip. Hgt: | -7.7705 m | -23.8483 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 10 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:AG9916 | Rover:0002 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 50.88752" N |
| Longitude: | 74° 26' 46.04498" W | 74° 29' 58.11627" W |
| Ellip. Hgt: | -7.7705 m | -20.8689 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |
| Quality: | Sd. Lat: 0.0003 m<br>Posn. Qlty: 0.0004 m | Sd. Lon: 0.0002 m<br>Sd. Slope: 0.0003 m<br>Sd. Hgt: 0.0006 m |

Leica Geosystems

# Results - Baseline
# kv6616 - 0003

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:32 |

## Point Information

| | Reference: kv6616 | Rover: 0003 |
|---|---|---|
| Receiver type / S/N: | GX1230 / 457691 | GX1230GG / 350414 |
| Antenna type / S/N: | AX1202 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.2130 m | 1.0600 m |
| Initial coordinates: | | |
| Latitude: | 40° 35' 55.60854" N | 40° 34' 41.91657" N |
| Longitude: | 74° 27' 17.22829" W | 74° 29' 30.55709" W |
| Ellip. Hgt: | -14.4010 m | -28.5324 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 2 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:kv6616 | Rover:0003 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 55.60854" N | 40° 34' 41.91241" N |
| Longitude: | 74° 27' 17.22829" W | 74° 29' 30.58444" W |
| Ellip. Hgt: | -14.4010 m | -22.0034 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |
| Quality: | Sd. Lat: 0.0002 m<br>Posn. Qlty: 0.0002 m | Sd. Lon: 0.0001 m<br>Sd. Slope: 0.0001 m<br>Sd. Hgt: 0.0006 m |

Leica Geosystems

# Results - Baseline
# AG9916 - 0003

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:32 |

## Point Information

| | Reference: AG9916 | Rover: 0003 |
|---|---|---|
| Receiver type / S/N: | SR530 / 38743 | GX1230GG / 350414 |
| Antenna type / S/N: | AT502 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.1530 m | 1.0600 m |
| Initial coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 41.91657" N |
| Longitude: | 74° 26' 46.04498" W | 74° 29' 30.55709" W |
| Ellip. Hgt: | -7.7705 m | -28.5324 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 10 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:AG9916 | Rover:0003 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 41.91192" N |
| Longitude: | 74° 26' 46.04498" W | 74° 29' 30.58487" W |
| Ellip. Hgt: | -7.7705 m | -21.9826 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| | | | |
|---|---|---|---|
| Quality: | Sd. Lat: 0.0004 m | Sd. Lon: 0.0003 m | Sd. Hgt: 0.0013 m |
| | Posn. Qlty: 0.0005 m | Sd. Slope: 0.0003 m | |

Leica Geosystems

# Results - Baseline
# kv6616 - 0004

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:32 |

## Point Information

| | Reference: kv6616 | Rover: 0004 |
|---|---|---|
| Receiver type / S/N: | GX1230 / 457691 | GX1230GG / 350414 |
| Antenna type / S/N: | AX1202 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.2130 m | 0.9830 m |
| Initial coordinates: | | |
| Latitude: | 40° 35' 55.60854" N | 40° 34' 38.60917" N |
| Longitude: | 74° 27' 17.22829" W | 74° 29' 16.81015" W |
| Ellip. Hgt: | -14.4010 m | -25.9621 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 2 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:kv6616 | Rover:0004 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 55.60854" N | 40° 34' 38.57803" N |
| Longitude: | 74° 27' 17.22829" W | 74° 29' 16.80024" W |
| Ellip. Hgt: | -14.4010 m | -20.4525 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |
| Quality: | Sd. Lat: 0.0002 m<br>Posn. Qlty: 0.0002 m | Sd. Lon: 0.0001 m<br>Sd. Slope: 0.0002 m<br>Sd. Hgt: 0.0006 m |

Leica Geosystems

# Results - Baseline
# AG9916 - 0004

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:33 |

## Point Information

| | Reference: AG9916 | Rover: 0004 |
|---|---|---|
| Receiver type / S/N: | SR530 / 38743 | GX1230GG / 350414 |
| Antenna type / S/N: | AT502 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.1530 m | 0.9830 m |
| Initial coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 38.60917" N |
| Longitude: | 74° 26' 46.04498" W | 74° 29' 16.81015" W |
| Ellip. Hgt: | -7.7705 m | -25.9621 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 10 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:AG9916 | Rover:0004 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 38.57769" N |
| Longitude: | 74° 26' 46.04498" W | 74° 29' 16.80055" W |
| Ellip. Hgt: | -7.7705 m | -20.4323 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| | | | |
|---|---|---|---|
| Quality: | Sd. Lat: 0.0005 m | Sd. Lon: 0.0004 m | Sd. Hgt: 0.0015 m |
| | Posn. Qlty: 0.0006 m | Sd. Slope: 0.0004 m | |

Leica Geosystems

# Results - Baseline
# kv6616 - 0005

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:33 |

## Point Information

| | Reference: kv6616 | Rover: 0005 |
|---|---|---|
| Receiver type / S/N: | GX1230 / 457691 | GX1230GG / 350414 |
| Antenna type / S/N: | AX1202 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.2130 m | 1.1050 m |
| Initial coordinates: | | |
| Latitude: | 40° 35' 55.60854" N | 40° 34' 51.43508" N |
| Longitude: | 74° 27' 17.22829" W | 74° 28' 37.06419" W |
| Ellip. Hgt: | -14.4010 m | -20.2674 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 2 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:kv6616 | Rover:0005 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 55.60854" N | 40° 34' 51.39335" N |
| Longitude: | 74° 27' 17.22829" W | 74° 28' 37.06541" W |
| Ellip. Hgt: | -14.4010 m | -18.3625 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |
| Quality: | Sd. Lat: 0.0002 m<br>Posn. Qlty: 0.0003 m | Sd. Lon: 0.0002 m<br>Sd. Slope: 0.0002 m<br>Sd. Hgt: 0.0005 m |

Leica Geosystems

# Results - Baseline
# AG9916 - 0005

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:33 |

## Point Information

| | Reference: AG9916 | Rover: 0005 |
|---|---|---|
| Receiver type / S/N: | SR530 / 38743 | GX1230GG / 350414 |
| Antenna type / S/N: | AT502 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.1530 m | 1.1050 m |
| Initial coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 51.43508" N |
| Longitude: | 74° 26' 46.04498" W | 74° 28' 37.06419" W |
| Ellip. Hgt: | -7.7705 m | -20.2674 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 10 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:AG9916 | Rover:0005 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 51.39287" N |
| Longitude: | 74° 26' 46.04498" W | 74° 28' 37.06573" W |
| Ellip. Hgt: | -7.7705 m | -18.3244 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |
| Quality: | Sd. Lat: 0.0005 m<br>Posn. Qlty: 0.0007 m | Sd. Lon: 0.0005 m<br>Sd. Slope: 0.0006 m<br>Sd. Hgt: 0.0012 m |

Leica Geosystems

# Results - Baseline
# kv6616 - 0006

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:33 |

## Point Information

| | Reference: kv6616 | Rover: 0006 |
|---|---|---|
| Receiver type / S/N: | GX1230 / 457691 | GX1230GG / 350414 |
| Antenna type / S/N: | AX1202 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.2130 m | 1.1450 m |
| Initial coordinates: | | |
| Latitude: | 40° 35' 55.60854" N | 40° 34' 33.91912" N |
| Longitude: | 74° 27' 17.22829" W | 74° 27' 28.61280" W |
| Ellip. Hgt: | -14.4010 m | -16.3076 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 2 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:kv6616 | Rover:0006 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 55.60854" N | 40° 34' 33.88995" N |
| Longitude: | 74° 27' 17.22829" W | 74° 27' 28.59645" W |
| Ellip. Hgt: | -14.4010 m | -14.5590 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| | | | |
|---|---|---|---|
| Quality: | Sd. Lat: 0.0001 m | Sd. Lon: 0.0001 m | Sd. Hgt: 0.0003 m |
| | Posn. Qlty: 0.0002 m | Sd. Slope: 0.0001 m | |

Leica Geosystems

# Results - Baseline
# AG9916 - 0006

## Project Information

| | |
|---|---|
| Project name: | gps101310 |
| Date created: | 10/15/2010 08:14:49 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 10/27/2010 11:37:33 |

## Point Information

| | Reference: AG9916 | Rover: 0006 |
|---|---|---|
| Receiver type / S/N: | SR530 / 38743 | GX1230GG / 350414 |
| Antenna type / S/N: | AT502 Tripod / - | AX1202 Tripod / - |
| Antenna height: | 1.1530 m | 1.1450 m |
| Initial coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 33.91912" N |
| Longitude: | 74° 26' 46.04498" W | 74° 27' 28.61280" W |
| Ellip. Hgt: | -7.7705 m | -16.3076 m |

## Processing Parameters

| Parameters | Selected | Used | Comment |
|---|---|---|---|
| Cut-off angle: | 15° | 15° | |
| Ephemeris type (GPS): | Broadcast | Broadcast | |
| Ephemeris type (GLONASS): | Broadcast | Broadcast | |
| Solution type: | Automatic | Phase: all fix | |
| GNSS type: | Automatic | GPS | |
| Frequency: | Automatic | Automatic | |
| Fix ambiguities up to: | 80 km | 80 km | |
| Min. duration for float solution (static): | 5' 00" | 5' 00" | |
| Sampling rate: | Use all | 10 | |
| Tropospheric model: | Hopfield | Hopfield | |
| Ionospheric model: | Automatic | Computed | |
| Use stochastic modelling: | Yes | Yes | |
| Min. distance: | 8 km | 8 km | |
| Ionospheric activity: | Automatic | Automatic | |

## Satellite Selection

| | |
|---|---|
| Manually disabled GPS satellites (PRNs): | None |

| | |
|---|---|
| Manually disabled GLONASS satellites (Slot Id): | None |

## Final Coordinates

| | Reference:AG9916 | Rover:0006 |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 33.88970" N |
| Longitude: | 74° 26' 46.04498" W | 74° 27' 28.59699" W |
| Ellip. Hgt: | -7.7705 m | -14.5373 m |

| | | | |
|---|---|---|---|
| Solution type: | Phase: all fix | | |
| GNSS type: | GPS | | |
| Frequency: | L1 and L2 | | |
| Ambiguity: | Yes | | |
| Quality: | Sd. Lat: 0.0002 m | Sd. Lon: 0.0002 m | Sd. Hgt: 0.0004 m |
| | Posn. Qlty: 0.0003 m | Sd. Slope: 0.0002 m | |

# Processing Summary
# gpsboundbrook101410

## Project Information

| | |
|---|---|
| Project name: | gpsboundbrook101410 |
| Date created: | 02/21/2011 11:48:56 |
| Time zone: | -5h 00' |
| Coordinate system name: | NEW JERSEY NAD83 (3) |
| Application software: | LEICA Geo Office 7.0 |
| Start date and time: | 10/14/2010 09:42:43 |
| End date and time: | 10/14/2010 13:05:35 |
| Manually occupied points: | 11 |
| Processing kernel: | PSI-Pro 2.0 |
| Processed: | 02/21/2011 12:01:21 |

## Processing Parameters

| **Parameters** | **Selected** |
|---|---|
| Cut-off angle: | 15° |
| Ephemeris type: | Broadcast |
| Solution type: | Automatic |
| GNSS type: | Automatic |
| Frequency: | Automatic |
| Fix ambiguities up to: | 80 km |
| Min. duration for float solution (static): | 5' 00" |
| Sampling rate: | Use all |
| Tropospheric model: | Hopfield |
| Ionospheric model: | Automatic |
| Use stochastic modelling: | Yes |
| Min. distance: | 8 km |
| Ionospheric activity: | Automatic |

## Baseline Overview

| **kv6805 - 0007** | **Reference: kv6805** | **Rover: 0007** |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 04.92622" N | 40° 34' 40.23008" N |
| Longitude: | 74° 21' 17.72313" W | 74° 26' 54.87534" W |
| Ellip. Hgt: | 10.4246 m | -16.1949 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| **AG 9916 - 0007** | **Reference: AG 9916** | **Rover: 0007** |
|---|---|---|

| | | |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 40.23051" N |
| Longitude: | 74° 26' 46.04498" W | 74° 26' 54.87552" W |
| Ellip. Hgt: | -7.7705 m | -16.1772 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| **kv6805 - 0008** | **Reference: kv6805** | **Rover: 0008** |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 04.92622" N | 40° 34' 57.53703" N |
| Longitude: | 74° 21' 17.72313" W | 74° 25' 49.62862" W |
| Ellip. Hgt: | 10.4246 m | -14.6829 m |
| Solution type: | Float | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | No | |

| **kv6826 - 0008** | **Reference: kv6826** | **Rover: 0008** |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 36' 40.44222" N | 40° 34' 57.53723" N |
| Longitude: | 74° 22' 23.83894" W | 74° 25' 49.62816" W |
| Ellip. Hgt: | 4.6230 m | -14.5525 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| **AG 9916 - 0008** | **Reference: AG 9916** | **Rover: 0008** |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 57.53774" N |
| Longitude: | 74° 26' 46.04498" W | 74° 25' 49.62858" W |
| Ellip. Hgt: | -7.7705 m | -14.5612 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| **kv6826 - 0009** | **Reference: kv6826** | **Rover: 0009** |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 36' 40.44222" N | 40° 34' 43.88779" N |
| Longitude: | 74° 22' 23.83894" W | 74° 24' 43.92497" W |
| Ellip. Hgt: | 4.6230 m | -12.5994 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| **AG 9916 - 0009** | **Reference: AG 9916** | **Rover: 0009** |
|---|---|---|

| | | |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 43.88780" N |
| Longitude: | 74° 26' 46.04498" W | 74° 24' 43.92526" W |
| Ellip. Hgt: | -7.7705 m | -12.6003 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| **kv6826 - 0010** | **Reference: kv6826** | **Rover: 0010** |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 36' 40.44222" N | 40° 34' 23.84536" N |
| Longitude: | 74° 22' 23.83894" W | 74° 24' 23.83984" W |
| Ellip. Hgt: | 4.6230 m | -12.3699 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| **kv6524 - 0010** | **Reference: kv6524** | **Rover: 0010** |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 06.08626" N | 40° 34' 23.84519" N |
| Longitude: | 74° 30' 29.41843" W | 74° 24' 23.83972" W |
| Ellip. Hgt: | -19.3214 m | -12.4301 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

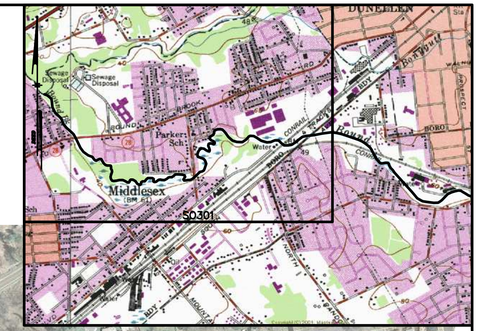
| **1 - 0010** | **Reference: 1** | **Rover: 0010** |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 35' 02.12585" N | 40° 34' 23.84586" N |
| Longitude: | 74° 30' 14.68360" W | 74° 24' 23.84194" W |
| Ellip. Hgt: | 12.7468 m | 20.7053 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

| **AG 9916 - 0010** | **Reference: AG 9916** | **Rover: 0010** |
|---|---|---|
| Coordinates: | | |
| Latitude: | 40° 33' 26.21313" N | 40° 34' 23.84541" N |
| Longitude: | 74° 26' 46.04498" W | 74° 24' 23.84000" W |
| Ellip. Hgt: | -7.7705 m | -12.3586 m |
| Solution type: | Phase: all fix | |
| GNSS type: | GPS | |
| Frequency: | L1 and L2 | |
| Ambiguity: | Yes | |

# Land Survey Figures

## TRANSECT COORDINATE TABLE:

| PAI # | NORTHING | EASTING | ELEVATION | TRANSECT # |
|---|---|---|---|---|
| 1003 | N637994.4 | E491303.12 | 32.06 | T-0 LEFT 0.0 |
| 1004 | N637980.65 | E491235.89 | 31.91 | T-0 RIGHT 0.0 |
| 1001 | N637600.14 | E491526.52 | 30.67 | T-5 RIGHT 0.1 |
| 1002 | N637657.42 | E491522.08 | 31.14 | T-5 LEFT 0.1 |
| 1005 | N637322.73 | E491711.16 | 30.69 | T-10 LEFT 0.2 |
| 1006 | N637301.66 | E491675.62 | 31.91 | T-10 RIGHT 0.2 |
| 1007 | N636912.97 | E491994.6 | 33.28 | T-15 LEFT 0.3 |
| 1008 | N636889.68 | E491953.96 | 34.83 | T-15 RIGHT 0.3 |
| 1009 | N636542.8 | E492320.38 | 34.87 | T-20 LEFT 0.4 |
| 1010 | N636522.99 | E492266.24 | 35.90 | T-20 RIGHT 0.4 |
| 1012 | N636085.23 | E492507.23 | 32.62 | T-25 LEFT 0.5 |
| 1013 | N636062.8 | E492471.82 | 34.45 | T-25 RIGHT 0.5 |
| 1014 | N635876.17 | E492890.77 | 31.58 | T-30 LEFT 0.6 |
| 1015 | N635845.26 | E492886 | 32.08 | T-30 RIGHT 0.6 |
| 1016 | N635571.44 | E493259.42 | 34.49 | T-35 RIGHT 0.7 |
| 1017 | N635599.46 | E493297.24 | 33.87 | T-35 LEFT 0.7 |
| 1018 | N635335.18 | E493672.39 | 32.17 | T-40 LEFT 0.8 |
| 1019 | N635293.75 | E493668.47 | 34.70 | T-40 RIGHT 0.8 |
| 1020 | N635253.64 | E494168.18 | 33.22 | T-45 RIGHT 0.9 |
| 1021 | N635295.38 | E494168.28 | 34.46 | T-45 LEFT 0.9 |
| 2004 | N635322.03 | E494637.85 | 32.25 | T-50 LEFT 1.0 |
| 2005 | N635287.24 | E494655.68 | 34.18 | T-50 RIGHT 1.0 |
| 2002 | N635449.99 | E495099.28 | 34.09 | T-55 RIGHT 1.04 |
| 2003 | N635481.63 | E495111.6 | 35.34 | T-55 LEFT 1.04 |
| 2000 | N635330.11 | E495286.48 | 36.56 | T-60 LEFT 1.13 |
| 2001 | N635277.84 | E495303.77 | 38.68 | T-60 RIGHT 1.13 |
| 2008 | N635559.99 | E495691.63 | 34.61 | T-65 RIGHT 1.2 |
| 2009 | N635564.74 | E495653.74 | 36.64 | T-65 LEFT 1.2 |
| 2010 | N635876.68 | E495455 | 38.40 | T-70 LEFT 1.3 |
| 2011 | N635879.89 | E495503.03 | 37.01 | T-70 RIGHT 1.3 |
| 3003 | N636014.45 | E495744.89 | 36.00 | T-75 LEFT 1.4 |
| 3004 | N636012.43 | E495794.31 | 36.73 | T-75 RIGHT 1.4 |
| 3000 | N636307.24 | E495816.42 | 39.88 | T-80 LEFT 1.5 |
| 3001 | N636314.46 | E495855.85 | 38.37 | T-80 RIGHT 1.5 |
| 3005 | N636539.92 | E496180.88 | 36.29 | T-85 LEFT 1.6 |
| 3006 | N636510.28 | E496153.19 | 37.91 | T-85 RIGHT 1.6 |
| 3007 | N636314.1 | E496467.4 | 37.27 | T-90 LEFT 1.7 |
| 3008 | N636348.78 | E496426.82 | 38.17 | T-90 RIGHT 1.7 |
| 3009 | N636388.02 | E496791.93 | 38.45 | T-95 RIGHT 1.8 |
| 3010 | N636422.19 | E496762.76 | 39.06 | T-95 LEFT 1.8 |
| 3011 | N636281.14 | E497247.38 | 40.26 | T-100 RIGHT 1.9 |
| 3012 | N636325.62 | E497268.97 | 39.63 | T-100 LEFT 1.9 |
| 2020 | N636271.9788 | E497617.5114 | 42.08 | T-105 RIGHT 2.0 |
| 2021 | N636313.5372 | E497657.228 | 40.83 | T-105 LEFT 2.0 |
| 2018 | N636197.8579 | E498074.7838 | 43.3 | T-110 RIGHT 2.1 |
| 2019 | N636257.9843 | E498062.9213 | 42.71 | T-110 LEFT 2.1 |




LOCATION MAP
USGS QUAD SHEET (PLAINFIELD, NJ)
SCALE: 1" = 2000'

## NOTES:

1) LOCATION: MIDDLESEX COUNTY, NEW JERSEY.

2) INFORMATION SHOWN HEREON IS BASED ON A FIELD SURVEY COMPLETED BY PENNONI ASSOCIATES INC. BETWEEN THE DATES OF 11/02/2010 AND 11/29/2010.

3) IT IS THE RESPONSIBILITY OF ALL DESIGNERS & CONTRACTORS UTILIZING THIS PLAN & THE INFORMATION CONTAINED THEREON TO CALL THE NJ ONE-CALL SYSTEM AT 1-800-272-1000 FOR FIELD LOCATION OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.

4) VERTICAL DATUM AS SHOWN IS BASED ON NAVD 88
HORIZONTAL DATUM AS SHOWN IS BASED ON N.J.S.P.C.S. 83

5) 2007 HIGH RESOLUTION ORTHOIMAGERY OBTAINED FROM THE NEW JERSEY INFORMATION NETWORK.

6) BENCHMARKS:
PID – AG3916
STATE/COUNTY – NJ/MIDDLESEX
N 827919.1536
E 567094.2569
EL 52.6358

PID – KV8524
STATE/COUNTY – NJ/SOMERSET
N 638020.8938
E 489855.4324
EL. 45.2160

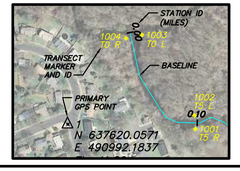
PID – KV8616
STATE/COUNTY – NJ/UNION
N 643035.2136
E 504679.7990
EL. 60.9889

PID – KV8805
STATE/COUNTY – NJ/MIDDLESEX
N 367936.5898
E 532417.3677
EL. 141.6507

PID – 6826
STATE/COUNTY – NJ/UNION
N 647594.0785
E 527302.7852
EL. 122.7982

## KEY:

ALL LABELS TYPICAL




GRAPHIC SCALE
300 0 150 300 600 1200
( IN FEET )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Consulting Engineers
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28003300

Pennoni


| DATE | NO. | REVISIONS | BY |
|---|---|---|---|

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY CHANGES BEFORE PROCEEDING WITH THE WORK.

DENNIS S. DiBLASIO
PROFESSIONAL LAND SURVEYOR
NEW JERSEY LICENSE No. GS 02830700

LAND SURVEY (CDE-OU4Q-REQ 01)
OPERABLE UNIT 4 (BOUND BROOK)
MIDDLESEX COUNTY, NEW JERSEY

**PLAN OF SURVEY**

THE LOUIS BERGER GROUP, INC.
565 TAXTER ROAD, SUITE 510
ELMSFORD, NY 10523


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JOB NO. LBGI 1001
SHEET 1 OF 4

SCALE 1" = 300'
DRAWN BY JFZ
DATE 12/01/2010
APPROVED

DRAWING NO. S0301

LBGI 1001

## NOTES:

1) LOCATION: MIDDLESEX COUNTY, NEW JERSEY

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EL 82.6556

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E 489855.4524
EL. 45.2160

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N 643035.2136
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N 367936.5898
E 532417.3677
EL. 141.6507

PID – 6826
STATE/COUNTY – NJ/UNION
N 647594.0785
E 527302.7852
EL. 122.7982

## KEY:

ALL LABELS TYPICAL




## TRANSECT COORDINATE TABLE:

| PAI # | NORTHING | EASTING | ELEVATION | TRANSECT# |
|---|---|---|---|---|
| 2015 | N636445.5329 | E498406.2566 | 45.98 | T-115 RIGHT 2.2 |
| 2016 | N636498.2312 | E498426.4372 | 46.11 | T- 115 LEFT 2.2 |
| 2017 | N636524.2946 | E498929.8824 | 40.49 | T-120 RIGHT 2.3 |
| 2023 | N636570.5281 | E498933.4746 | 40.95 | T- 120 LEFT 2.3 |
| 2024 | N636420.7767 | E499443.9721 | 41.85 | T-125 RIGHT 2.4 |
| 2025 | N636478.9304 | E499477.4564 | 41.72 | T- 125 LEFT 2.4 |
| 2026 | N636269.6508 | E499894.7639 | 41.83 | T-130 RIGHT 2.5 |
| 2027 | N636310.7674 | E499914.1254 | 42.2 | T- 130 LEFT 2.5 |
| 2028 | N635900.7383 | E500197.993 | 42.08 | T-135 LEFT 2.55 |
| 2029 | N635911.4772 | E500151.7817 | 42.15 | T-135 RIGHT 2.55 |
| 2030 | N635736.0578 | E500563.4291 | 43.97 | T-140 RIGHT 2.65 |
| 2031 | N635777.2702 | E500600.1333 | 42.73 | T-140 LEFT 2.65 |
| 2032 | N635349.2578 | E500845.77 | 43.29 | T-145 RIGHT 2.7 |
| 2033 | N635391.8995 | E500896.4032 | 43.65 | T- 145 LEFT 2.7 |
| 2034 | N634978.2558 | E501181.4695 | 44 | T- 150 LEFT 2.8 |
| 2035 | N634938.336 | E501140.1339 | 42.92 | T-150 RIGHT 2.8 |
| 2046 | N634757.2753 | E501580.0469 | 44.28 | T- 155 LEFT 2.9 |
| 2047 | N634703.9956 | E501558.6435 | 46.22 | T-155 RIGHT 2.9 |
| 2044 | N634803.978 | E502000.3002 | 45.52 | T- 160 LEFT 3.0 |
| 2045 | N634743.8503 | E502048.2219 | 45.92 | T-160 RIGHT 3.0 |
| 2042 | N635028.8232 | E502421.7199 | 44.98 | T-165 RIGHT 3.1 |
| 2043 | N635079.3584 | E502403.9594 | 48.81 | T- 165 LEFT 3.1 |
| 2040 | N634902.2892 | E502753.3576 | 50.77 | T-170 RIGHT 3.2 |
| 2041 | N634977.3607 | E502742.7951 | 54.25 | T- 170 LEFT 3.2 |
| 2049 | N635038.3389 | E503248.7452 | 45.78 | T- 175 LEFT 3.3 |
| 2050 | N634983.1847 | E503264.5117 | 49.85 | T-175 RIGHT 3.3 |

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NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28003300

Pennoni

| DATE | NO. | REVISIONS | BY |
|---|---|---|---|
| | | | |

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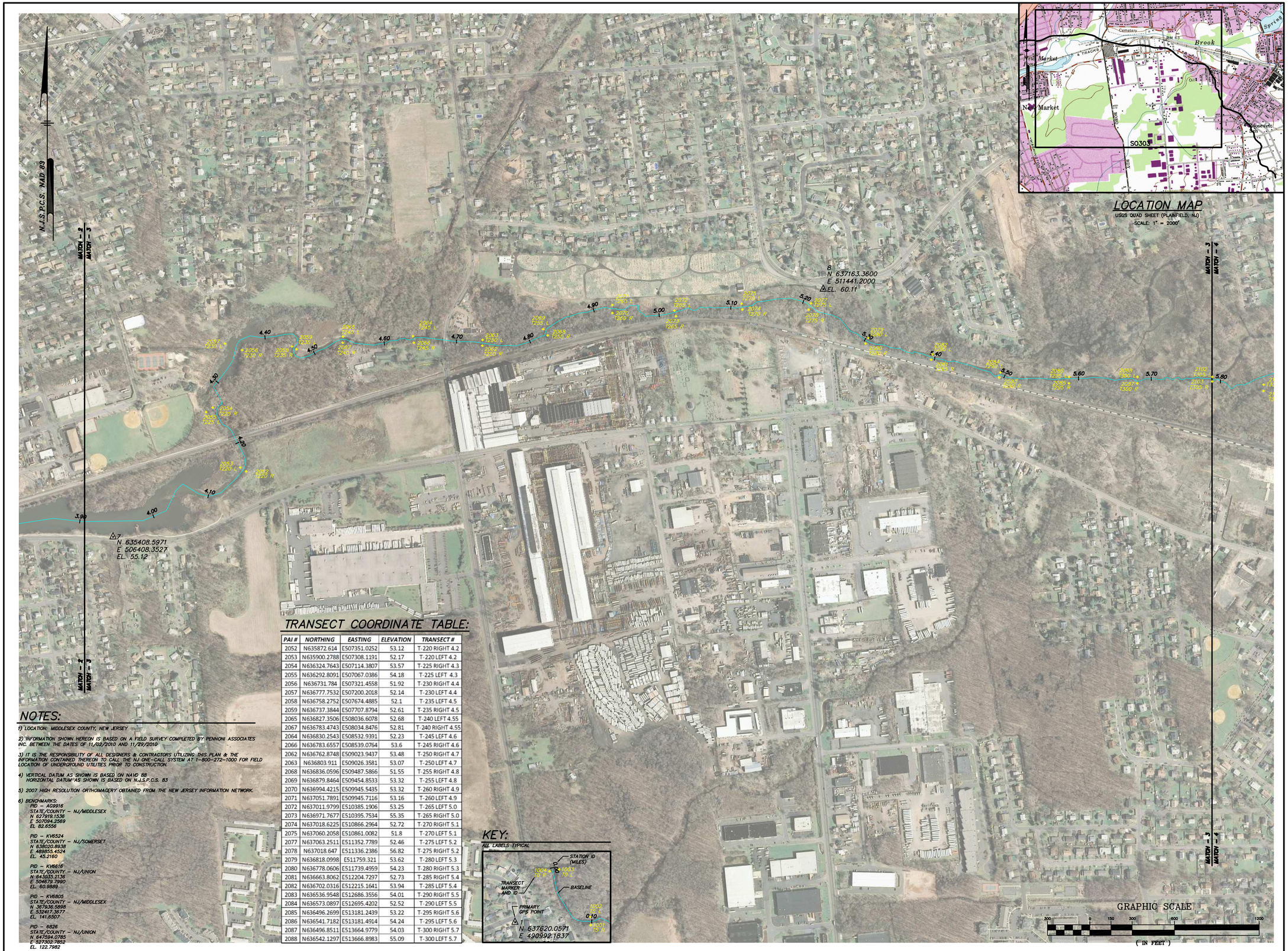
JOB NO. LBGI 1001
SHEET 2 OF 4

SCALE 1" = 300'
DRAWN BY JFZ
DATE 12/01/2010
APPROVED
DRAWING NO. S0302

LBGI 1001




## LOCATION MAP

USGS QUAD SHEET (PLAINFIELD, NJ)

SCALE: 1" = 2000'



## TRANSECT COORDINATE TABLE:

| PAI # | NORTHING | EASTING | ELEVATION | TRANSECT # |
|---|---|---|---|---|
| 2052 | N635872.614 | E507351.0252 | 53.12 | T-220 RIGHT 4.2 |
| 2053 | N635900.2788 | E507308.1191 | 52.17 | T-220 LEFT 4.2 |
| 2054 | N636324.7643 | E507114.3807 | 53.57 | T-225 RIGHT 4.3 |
| 2055 | N636292.8091 | E507067.0386 | 54.18 | T-225 LEFT 4.3 |
| 2056 | N636731.784 | E507321.4558 | 51.92 | T-230 RIGHT 4.4 |
| 2057 | N636777.7532 | E507200.2018 | 52.14 | T-230 LEFT 4.4 |
| 2058 | N636758.2752 | E507674.4885 | 52.1 | T-235 LEFT 4.5 |
| 2059 | N636737.3844 | E507707.8794 | 52.61 | T-235 RIGHT 4.5 |
| 2065 | N636827.3506 | E508036.6078 | 52.68 | T-240 LEFT 4.55 |
| 2067 | N636783.4743 | E508034.8476 | 52.81 | T-240 RIGHT 4.55 |
| 2064 | N636830.2543 | E508532.9391 | 52.23 | T-245 LEFT 4.6 |
| 2066 | N636783.6557 | E508539.0764 | 53.6 | T-245 RIGHT 4.6 |
| 2062 | N636762.8748 | E509023.9437 | 53.48 | T-250 RIGHT 4.7 |
| 2063 | N636803.911 | E509026.3581 | 53.07 | T-250 LEFT 4.7 |
| 2068 | N636836.0596 | E509487.5866 | 51.55 | T-255 RIGHT 4.8 |
| 2069 | N636879.8464 | E509454.8533 | 53.32 | T-255 LEFT 4.8 |
| 2070 | N636994.4215 | E509945.5435 | 53.32 | T-260 RIGHT 4.9 |
| 2071 | N637051.7891 | E509945.7116 | 53.16 | T-260 LEFT 4.9 |
| 2072 | N637011.9799 | E510385.1906 | 53.25 | T-265 LEFT 5.0 |
| 2073 | N636971.7677 | E510395.7534 | 55.35 | T-265 RIGHT 5.0 |
| 2074 | N637018.6225 | E510866.2964 | 52.72 | T-270 RIGHT 5.1 |
| 2075 | N637060.2058 | E510861.0082 | 51.8 | T-270 LEFT 5.1 |
| 2077 | N637063.2511 | E511352.7789 | 52.46 | T-275 LEFT 5.2 |
| 2078 | N637018.647 | E511336.2386 | 56.82 | T-275 RIGHT 5.2 |
| 2079 | N636818.0998 | E511759.321 | 53.62 | T-280 LEFT 5.3 |
| 2080 | N636778.0606 | E511739.4959 | 54.23 | T-280 RIGHT 5.3 |
| 2081 | N636663.8062 | E512204.7297 | 52.73 | T-285 RIGHT 5.4 |
| 2082 | N636702.0316 | E512215.1641 | 53.94 | T-285 LEFT 5.4 |
| 2083 | N636536.9548 | E512686.3556 | 54.01 | T-290 RIGHT 5.5 |
| 2084 | N636573.0897 | E512695.4202 | 52.52 | T-290 LEFT 5.5 |
| 2085 | N636496.2699 | E513181.2439 | 53.22 | T-295 RIGHT 5.6 |
| 2086 | N636541.7182 | E513181.4914 | 54.24 | T-295 LEFT 5.6 |
| 2087 | N636496.8511 | E513664.9779 | 54.03 | T-300 RIGHT 5.7 |
| 2088 | N636542.1297 | E513666.8983 | 55.09 | T-300 LEFT 5.7 |

## NOTES:

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N 638020.8938
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STATE/COUNTY – NJ/UNION
N 643035.2136
E 504679.7990
EL 60.9889

PID – KV6805
STATE/COUNTY – NJ/MIDDLESEX
N 357936.5898
E 532417.3677
EL 141.6507

PID – 8826
STATE/COUNTY – NJ/UNION
N 647594.0785
E 527302.7852
EL 122.7982

## KEY:

ALL LABELS TYPICAL




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585 TAXTER ROAD, SUITE 510
ELMSFORD, NY 10523

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JOB NO. LBGI 1001

SHEET 3 OF 4

SCALE 1" = 300'

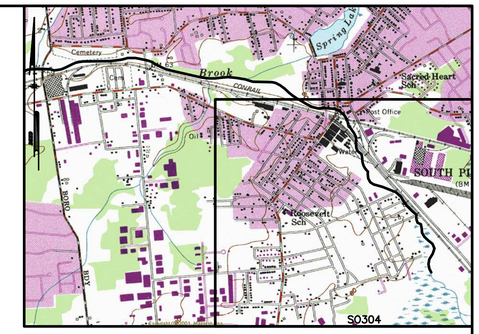
DRAWN BY JFZ

DATE 12/01/2010

APPROVED

DRAWING NO. S0303

LBGI 1001




## LOCATION MAP

USGS QUAD SHEET (PLAINFIELD, NJ)

SCALE: 1" = 2000'

## NOTES:

1) LOCATION: MIDDLESEX COUNTY, NEW JERSEY

2) INFORMATION SHOWN HEREON IS BASED ON A FIELD SURVEY COMPLETED BY PENNONI ASSOCIATES INC. BETWEEN THE DATES OF 11/02/2010 AND 11/29/2010

3) IT IS THE RESPONSIBILITY OF ALL DESIGNERS & CONTRACTORS UTILIZING THIS PLAN & THE INFORMATION CONTAINED THEREON TO CALL THE NJ ONE-CALL SYSTEM AT 1-800-272-1000 FOR FIELD LOCATION OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.

4) VERTICAL DATUM AS SHOWN IS BASED ON NAVD 88
HORIZONTAL DATUM AS SHOWN IS BASED ON N.J.S.P.C.S. 83

5) 2007 HIGH RESOLUTION ORTHOIMAGERY OBTAINED FROM THE NEW JERSEY INFORMATION NETWORK.

6) BENCHMARKS:

PID – AG9916
STATE/COUNTY – NJ/MIDDLESEX
N 627919.1536
E 507094.2569
EL 82.6556

PID – KV6524
STATE/COUNTY – NJ/SOMERSET
N 638020.8938
E 489855.4524
EL 45.2160

PID – KV6616
STATE/COUNTY – NJ/UNION
N 643035.2136
E 504679.7990
EL 60.9889

PID – KV6805
STATE/COUNTY – NJ/MIDDLESEX
N 367936.5898
E 532417.3677
EL 141.6507

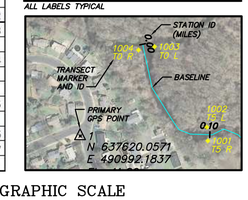
PID – 6826
STATE/COUNTY – NJ/UNION
N 647594.0785
E 527302.7852
EL 122.7982

## TRANSECT COORDINATE TABLE:

| PAI # | NORTHING | EASTING | ELEVATION | TRANSECT # |
|---|---|---|---|---|
| 2102 | N636542.2127 | E514197.3163 | 53.66 | T-305 LEFT 5.8 |
| 2103 | N636509.6515 | E514196.0652 | 53.65 | T-305 RIGHT 5.8 |
| 2100 | N636487.3545 | E514561.2174 | 54.51 | T-309 LEFT 5.9 |
| 2101 | N636442.7486 | E514559.2046 | 55.41 | T-309 RIGHT 5.9 |
| 2098 | N636430.9086 | E514951.0814 | 55.47 | T-314 LEFT 6.0 |
| 2099 | N636406.4142 | E514934.205 | 54.55 | T-314 RIGHT 6.0 |
| 2096 | N636143.3759 | E515242.7333 | 54.24 | T-318 LEFT 6.1 |
| 2097 | N636116.8364 | E515227.1053 | 56.01 | T-318 RIGHT 6.1 |
| 2094 | N635899.3402 | E515646.9134 | 55.47 | T-323 LEFT 6.2 |
| 2095 | N635875.4692 | E515628.4313 | 58.43 | T-323 RIGHT 6.2 |
| 2092 | N635695.5222 | E516049.9048 | 54.24 | T-328 RIGHT 6.25 |
| 2093 | N635723.3406 | E516057.1 | 56.29 | T-328 LEFT 6.25 |
| 2090 | N635728.7453 | E516516.4804 | 58.44 | T-333 LEFT 6.3 |
| 2091 | N635703.0112 | E516497.224 | 58.97 | T-333 RIGHT 6.3 |
| 2105 | N635356.0065 | E516814.1018 | 60.02 | T-338 RIGHT 6.4 |
| 2106 | N635373.3786 | E516843.055 | 59.36 | T-338 LEFT 6.4 |
| 2107 | N634919.6329 | E516903.751 | 58.76 | T-343 LEFT 6.5 |
| 2108 | N634913.8027 | E516884.944 | 59.55 | T-343 RIGHT 6.5 |
| 2109 | N634534.2433 | E517155.8363 | 58.95 | T-348 LEFT 6.6 |
| 2110 | N634543.6636 | E517137.0458 | 58.58 | T-348 RIGHT 6.6 |
| 2111 | N634101.3789 | E517342.3866 | 61.34 | T-353 LEFT 6.7 |
| 2112 | N634091.3517 | E517310.8395 | 62.32 | T-353 RIGHT 6.7 |
| 2113 | N633805.615 | E517522.8487 | 61.92 | T-358 LEFT 6.8 |
| 2114 | N633772.6846 | E517503.7892 | 62.95 | T-358 RIGHT 6.8 |
| 2116 | N633669.8929 | E518007.072 | 62.06 | T-363 LEFT 6.9 |
| 2117 | N633642.0115 | E517984.3564 | 61.69 | T-363 RIGHT 6.9 |
| 2118 | N633289.8308 | E518342.7796 | 66.93 | T-368 LEFT 7.0 |
| 2119 | N633270.988 | E518318.8587 | 64.45 | T-368 RIGHT 7.0 |
| 2120 | N632950.1561 | E518545.1754 | 63.31 | T-373 RIGHT 7.1 |
| 2121 | N632943.757 | E518606.7792 | 62.02 | T-373 LEFT 7.1 |
| 2122 | N632534.3091 | E518761.3849 | 62.23 | T-378 LEFT 7.2 |
| 2123 | N632517.1056 | E518728.7797 | 64.84 | T-378 RIGHT 7.2 |
| 2124 | N632141.835 | E519038.4646 | 62.55 | T-383 RIGHT 7.3 |
| 2125 | N632158.8027 | E519070.6322 | 63.84 | T-383 LEFT 7.3 |
| 2126 | N631735.4418 | E518893.9944 | 66.42 | T-388 RIGHT 7.4 |
| 2127 | N631756.3083 | E518936.1084 | 63.38 | T-388 LEFT 7.4 |
| 2128 | N631320.6768 | E519089.4729 | 63.55 | T-393 LEFT 7.5 |
| 2129 | N631291.0108 | E519067.7562 | 63.71 | T-393 RIGHT 7.5 |
| 2131 | N631060.0637 | E519444.0986 | 64.2 | T-398 LEFT 7.6 |
| 2132 | N631033.9726 | E519422.6024 | 64.56 | T-398 RIGHT 7.6 |
| 2133 | N630648.314 | E519715.1253 | 64.29 | T-403 RIGHT 7.7 |
| 2134 | N630650.629 | E519745.9529 | 63.78 | T-403 LEFT 7.7 |

## KEY:

ALL LABELS TYPICAL




GRAPHIC SCALE

300 0 150 300 600 1200

( IN FEET )


Pennoni Associates Inc.
515 Grove Street
Haddon Heights, N.J. 08035
TEL: 856 • 547 • 0505
FAX: 856 • 547 • 9174


Consulting Engineers
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28003300

Pennoni

| DATE | NO. | REVISIONS | BY |
|---|---|---|---|

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

DENNIS S. DiBLASIO
PROFESSIONAL LAND SURVEYOR
NEW JERSEY LICENSE No. GS 02830700

# LAND SURVEY (CDE-OU4Q-REQ 01)

OPERABLE UNIT 4 (BOUND BROOK)
MIDDLESEX, COUNTY, NEW JERSEY

## PLAN OF SURVEY

THE LOUIS BERGER GROUP, INC.
565 TAXTER ROAD, SUITE 510
ELMSFORD, NY 10523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SHEET 4 OF 4

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