

Final Survey Report Appendix

Light Detection and Ranging (LiDAR)
Contract Number 39891
Kansas Department of Agriculture South AOI
6531 SE Forbes Suite B
Topeka, Kansas
May 2016



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Section 1: Appendix

1.1 NGS Data Sheets

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.8

1 National Geodetic Survey, Retrieval Date = JANUARY 3, 2016

JH0363 *****

JH0363 DESIGNATION - A 20

JH0363 PID - JH0363

JH0363 STATE/COUNTY- KS/WALLACE

JH0363 COUNTRY - US

JH0363 USGS QUAD - SPRING VALLEY RANCH (1979)

JH0363

JH0363 *CURRENT SURVEY CONTROL

JH0363

JH0363* NAD 83(1986) POSITION- 38 51 35.62 (N) 101 45 02.96 (W) HD_HELD1

JH0363* NAVD 88 ORTHO HEIGHT - 1101.418 (meters) 3613.57 (feet) ADJUSTED

JH0363

JH0363 GEOID HEIGHT - -23.940 (meters) GEOID12B

JH0363 DYNAMIC HEIGHT - 1100.466 (meters) 3610.45 (feet) COMP

JH0363 MODELED GRAVITY - 979,725.6 (mgal) NAVD 88

JH0363

JH0363 VERT ORDER - SECOND CLASS 0

JH0363

JH0363.The horizontal coordinates were determined by differentially corrected
JH0363.hand held GPS observations or other comparable positioning techniques
JH0363.and have an estimated accuracy of +/- 3 meters.

JH0363.

JH0363.The orthometric height was determined by differential leveling and
JH0363.adjusted by the NATIONAL GEODETIC SURVEY

JH0363.in June 1991.

JH0363

JH0363.Significant digits in the geoid height do not necessarily reflect accuracy.

JH0363.GEOID12B height accuracy estimate available here.

JH0363

JH0363.The dynamic height is computed by dividing the NAVD 88

JH0363.geopotential number by the normal gravity value computed on the

JH0363.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

JH0363.degrees latitude (g = 980.6199 gals.).

JH0363

JH0363.The modeled gravity was interpolated from observed gravity values.

JH0363

JH0363; North East Units Estimated Accuracy

JH0363;SPC KS N - 65,195.1 74,539.5 MT (+/- 3 meters HH1 GPS)

JH0363



JH0363 SUPERSEDED SURVEY CONTROL
JH0363
JH0363 NGVD 29 (??/??/92) 1100.978 (m) 3612.13 (f) ADJ UNCH 2 0
JH0363

JH0363.Superseded values are not recommended for survey control.

JH0363

JH0363.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

JH0363.See file dsdata.txt to determine how the superseded data were derived.

JH0363

JH0363_U.S. NATIONAL GRID SPATIAL ADDRESS: 14SKJ6131204825(NAD 83)

JH0363

JH0363_MARKER: DB = BENCH MARK DISK

JH0363_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

JH0363_STAMPING: A 20 1934

JH0363_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

JH0363+STABILITY: SURFACE MOTION

JH0363_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

JH0363+SATELLITE: SATELLITE OBSERVATIONS - August 01, 2010

JH0363

JH0363 HISTORY - Date Condition Report By

JH0363 HISTORY - 1934 MONUMENTED CGS

JH0363 HISTORY - 1942 GOOD CGS

JH0363 HISTORY - 20100516 GOOD GEOCAC

JH0363 HISTORY - 20100801 GOOD KSDT

JH0363

JH0363 STATION DESCRIPTION

JH0363

JH0363'DESCRIBED BY COAST AND GEODETIC SURVEY 1942

JH0363'2.4 MI S FROM SHARON SPRINGS.

JH0363'2.4 MILES SOUTH ALONG STATE HIGHWAY 27 FROM THE CROSSING OF
JH0363'THE UNION PACIFIC RAILROAD AT SHARON SPRINGS, WALLACE COUNTY,
JH0363'600 FEET NORTH OF AN 18-INCH CORRUGATED-IRON PIPE CULVERT
JH0363'UNDER THE HIGHWAY, ON THE TOP OF A LONG HILL SLOPING NORTH,
JH0363'AND 39 FEET EAST OF THE CENTERLINE OF THE HIGHWAY, AND SET
JH0363'IN THE TOP OF A CONCRETE POST.

JH0363

JH0363 STATION RECOVERY (2010)

JH0363

JH0363'RECOVERY NOTE BY GEOCACHING 2010

JH0363'RECOVERED IN GOOD CONDITION.

JH0363

JH0363 STATION RECOVERY (2010)

JH0363

JH0363'RECOVERY NOTE BY KANSAS DEPARTMENT OF TRANSPORTATION 2010 (KLH)

JH0363'RECOVERED IN GOOD CONDITION.

*** retrieval complete.

Elapsed Time = 00:00:01



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

PROGRAM = datasheet95, VERSION = 8.8

1 National Geodetic Survey, Retrieval Date = JANUARY 3, 2016

KH0646 *****

KH0646 DESIGNATION - DUSTY

KH0646 PID - KH0646

KH0646 STATE/COUNTY- KS/THOMAS

KH0646 COUNTRY - US

KH0646 USGS QUAD - COLBY SW (1967)

KH0646

KH0646 *CURRENT SURVEY CONTROL

KH0646

KH0646* NAD 83(1997) POSITION- 39 19 21.18182(N) 101 08 26.00758(W) ADJUSTED

KH0646* NAVD 88 ORTHO HEIGHT - 984. (meters) 3228. (feet) SCALED

KH0646

KH0646 GEOID HEIGHT - -24.394 (meters) GEOID12B

KH0646 LAPLACE CORR - -1.90 (seconds) DEFLEC12B

KH0646 HORZ ORDER - SECOND

KH0646

KH0646.The horizontal coordinates were established by classical geodetic methods

KH0646.and adjusted by the National Geodetic Survey in October 1998.

KH0646.

KH0646.The orthometric height was scaled from a topographic map.

KH0646

KH0646.Significant digits in the geoid height do not necessarily reflect accuracy.

KH0646.GEOID12B height accuracy estimate available here.

KH0646

KH0646.The Laplace correction was computed from DEFLEC12B derived deflections.

KH0646

KH0646. The following values were computed from the NAD 83(1997) position.

KH0646

KH0646; North East Units Scale Factor Converg.

KH0646;SPC KS N - 114,510.178 129,250.061 MT 0.99995763 -1 59 13.5

KH0646;SPC KS N - 375,688.81 424,047.91 sFT 0.99995763 -1 59 13.5

KH0646;UTM 14 - 4,354,756.095 315,481.313 MT 1.00001922 -1 21 24.6

KH0646

KH0646! - Elev Factor x Scale Factor = Combined Factor

KH0646!SPC KS N - 0.99984941 x 0.99995763 = 0.99980705

KH0646!UTM 14 - 0.99984941 x 1.00001922 = 0.99986863

KH0646

KH0646: Primary Azimuth Mark Grid Az

KH0646:SPC KS N - DUSTY AZ MK RESET 093 45 00.5

KH0646:UTM 14 - DUSTY AZ MK RESET 093 07 11.6

KH0646

KH0646|-----|

KH0646| PID Reference Object Distance Geod. Az |

KH0646| dddmss.s |

KH0646| KH0640 COLBY STATE POLICE RADIO MAST APPROX. 9.6 KM 0364601.8 |

KH0646| KH0641 COLBY MUNICIPAL TANK APPROX.10.7 KM 0412041.8 |

KH0646| KH0643 COLBY THOMAS CO CTHSE CLOCK TR APPROX.11.7 KM 0454911.9 |

KH0646| KH0642 COLBY RADIO STATION KXXX MAST APPROX.14.2 KM 0565900.4 |

KH0646| CP7054 DUSTY AZ MK 0913957.8 |



KH0646 | CP7057 DUSTY AZ MK RESET 0914547.0 |
 KH0646 | KH0794 MINGO FARMERS COOP ELEVATOR APPROX.16.3 KM 1075051.2 |
 KH0646 | CP7055 DUSTY RM 1 17.745 METERS 18124 |
 KH0646 | CP7056 DUSTY RM 2 21.862 METERS 26919 |
 KH0646 | KH0669 BREWSTER MUNICIPAL TANK APPROX.21.0 KM 2832148.7 |
 KH0646 | KH0650 LEVANT HBS GRAIN CO ELEVATOR APPROX. 8.5 KM 3263143.1 |

KH0646 |-----|
 KH0646

KH0646 SUPERSEDED SURVEY CONTROL
 KH0646

KH0646 NAD 83(1986)- 39 19 21.18362(N) 101 08 26.00973(W) AD() 2
 KH0646 NAD 27 - 39 19 21.17000(N) 101 08 24.44600(W) AD() 2

KH0646
 KH0646.Superseded values are not recommended for survey control.
 KH0646

KH0646.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 KH0646.See file dsdata.txt to determine how the superseded data were derived.

KH0646
 KH0646_U.S. NATIONAL GRID SPATIAL ADDRESS: 14SLJ1548154756(NAD 83)
 KH0646

KH0646_MARKER: DS = TRIANGULATION STATION DISK
 KH0646_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 KH0646_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 KH0646+SATELLITE: SATELLITE OBSERVATIONS - July 31, 2007

KH0646
 KH0646 HISTORY - Date Condition Report By
 KH0646 HISTORY - 1951 MONUMENTED CGS
 KH0646 HISTORY - 1963 GOOD CGS
 KH0646 HISTORY - 1974 GOOD USAF
 KH0646 HISTORY - 20070731 GOOD KSDT

KH0646
 KH0646 STATION DESCRIPTION
 KH0646

KH0646'DESCRIBED BY COAST AND GEODETIC SURVEY 1951 (RLE)
 KH0646'THE STATION IS LOCATED ABOUT 7 MILES SOUTHWEST FROM COLBY,
 KH0646'ABOUT 5 MILES SOUTHEAST OF LEVANT AND IS SITUATED ON THE
 KH0646'SUMMIT OF A RISE. IT IS SET IN AN EAST-WEST FENCE LINE, 31
 KH0646'FEET NORTH FROM THE CENTER OF THE ROAD AND 6 FEET WEST OF A
 KH0646'WITNESS POST. IT IS STAMPED DUSTY 1951 AND PROJECTS 5 INCHES
 KH0646'ABOVE THE SURFACE OF THE GROUND.

KH0646'
 KH0646'REFERENCE MARK NO. 1 IS SET AT THE NORTH EDGE OF A FIELD,
 KH0646'28 FEET SOUTH FROM THE CENTER OF THE ROAD. IT IS STAMPED
 KH0646'DUSTY NO 1 1951 AND PROJECTS 4 INCHES.

KH0646'
 KH0646'REFERENCE MARK NO. 2 IS 29 FEET NORTH FROM THE CENTER OF THE
 KH0646'ROAD AND 2 FEET SOUTH OF THE FENCE LINE. IT IS STAMPED DUSTY NO
 KH0646'2 1951 AND PROJECTS 3 INCHES.

KH0646'
 KH0646'THE DISTANCE BETWEEN REFERENCE MARK NUMBER 1 AND NUMBER 2
 KH0646'IS 90.7 FEET.

KH0646'
 KH0646'THE AZIMUTH MARK IS LOCATED 45 FEET SOUTHEAST FROM THE CENTER

KH0646' OF A CROSSROAD INTERSECTION, 1 FOOT NORTH OF A TELEPHONE
KH0646' POLE AND FENCE CORNER, AND 1 FOOT WEST OF A WITNESS POST.
KH0646' IT IS STAMPED DUSTY 1951 AND PROJECTS 4 INCHES.

KH0646'

KH0646' TO REACH THE STATION FROM THE MAIN INTERSECTION AT THE TRAFFIC
KH0646' LIGHTS IN COLBY, GO WEST ON U.S. HIGHWAY 24 FOR 0.55 MILE
KH0646' TO A CROSS STREET AND A SIGN ON THE RIGHT ATWOOD, TURN LEFT
KH0646' AND GO SOUTH ON RANGE AVENUE (PASSING THE ST. THOMAS HOSPITAL
KH0646' ON THE RIGHT) FOR 1.2 MILES TO A T-ROAD, TURN RIGHT AND GO WEST
KH0646' FOR 4.1 MILES TO A CROSSROAD, TURN LEFT AND GO SOUTH FOR 4.0
KH0646' MILES TO A CROSSROAD AND THE AZIMUTH MARK ON THE LEFT. TURN
KH0646' RIGHT AND GO WEST FOR 0.6 MILE TO THE TOP OF A RISE AND THE
KH0646' STATION AS DESCRIBED.

KH0646'

KH0646' HEIGHT OF LIGHT ABOVE STATION MARK 23 METERS.

KH0646

KH0646 STATION RECOVERY (1963)

KH0646

KH0646' RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1963 (CJB)
KH0646' THIS STATION WAS RECOVERED AS DESCRIBED AND ALL MARKS WERE
KH0646' FOUND IN GOOD CONDITION, EXCEPT THE AZIMUTH MARK WHICH REQUIRED
KH0646' MOVING BECAUSE THE ROAD WAS BEING WIDENED AND GRADED. A
KH0646' COMPLETE DESCRIPTION FOLLOWS.

KH0646'

KH0646' STATION IS LOCATED ABOUT 7 MILES SOUTHWEST OF COLBY AND 5
KH0646' MILES SOUTHEAST OF THE SMALL TOWN OF LEVANT IN THE SW 1/4
KH0646' OF SEC. 29, T 8 S., R 34 W. ALONG THE NORTH SIDE OF AN EAST-WEST
KH0646' SECTION-LINE ROAD, AND ALONG THE SOUTH EDGE OF FIELD FARMED
KH0646' AND OWNED BY RONALD FRAHM WHOSE FARM BUILDINGS ARE 1/2 MILE
KH0646' EAST AND 1 MILE NORTH. THE STATION MARK IS ABOUT 200 YARDS
KH0646' WEST OF VACANT FARM BUILDINGS, 29 FEET NORTH OF THE CENTER
KH0646' OF EAST-WEST ROAD, AND 1 FOOT EAST OF A STEEL WITNESS POST
KH0646' WITH SIGN IN A FENCELINE. THE MARK PROJECTS 1 INCH AND THE
KH0646' DISK IS STAMPED DUSTY 1951.

KH0646'

KH0646' REFERENCE MARK NO. 1 IS SOUTH OF THE STATION AND 28 FEET SOUTH
KH0646' OF THE CENTER OF ROAD. THE MARK PROJECTS 2 INCHES AND THE
KH0646' DISK IS STAMPED DUSTY NO 1 1951.

KH0646'

KH0646' REFERENCE MARK NO. 2 IS WEST OF THE STATION IN FENCELINE
KH0646' AND 29 FEET NORTH OF THE CENTER OF ROAD. THE MARK PROJECTS
KH0646' 3 INCHES AND THE DISK IS STAMPED DUSTY NO 2 1951.

KH0646'

KH0646' AZIMUTH MARK (RESET) IS 0.55 MILE EAST OF THE STATION, 50
KH0646' FEET EAST OF THE CENTER OF NORTH-SOUTH GRADED ROAD, 28 FEET
KH0646' SOUTH OF THE CENTER OF EAST-WEST ROAD, 17 FEET EAST OF THE
KH0646' SOUTH END OF STEEL CULVERT, 7 FEET SOUTH OF A TELEPHONE POLE,
KH0646' 5 FEET SOUTH OF A FENCE CORNER, 1 FOOT WEST OF A FENCE, AND
KH0646' 1 FOOT NORTH OF A STEEL WITNESS POST WITH SIGN. THE MARK
KH0646' PROJECTS 6 INCHES AND THE DISK IS STAMPED DUSTY 1951 RESET
KH0646' 1963.

KH0646'

KH0646' TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 24 AND



KH0646'MAIN STREET IN COLBY, GO WEST ON U.S. HIGHWAY 24 FOR 0.55
KH0646'MILE TO THE JUNCTION OF STATE HIGHWAY 25. CONTINUE WEST ON
KH0646'U.S. HIGHWAY 24 FOR 4.0 MILES TO CROSSROADS. TURN LEFT AND
KH0646'GO SOUTH ON GRADED ROAD FOR 5.0 MILES TO CROSSROADS AND
KH0646'THE AZIMUTH MARK IN THE SOUTHEAST OF THE INTERSECTION AS
KH0646'DESCRIBED. TURN RIGHT AND GO WEST ON SECTION-LINE ROAD FOR
KH0646'0.55 MILE TO THE TOP OF GRADE AND THE STATION ON THE RIGHT
KH0646'AS DESCRIBED.

KH0646'

KH0646'HEIGHT OF LIGHT ABOVE STATION MARK 1 METERS.

KH0646

KH0646 STATION RECOVERY (1974)

KH0646

KH0646'RECOVERY NOTE BY US AIR FORCE 1974

KH0646'STATION, AZIMUTH MARK, AND R.M. 2 WERE RECOVERED IN GOOD CONDITION
KH0646'AS DESCRIBED.

KH0646'

KH0646'R.M. 1 WAS NOT RECOVERED, AND MAY HAVE BEEN DESTROYED DURING
KH0646'FARMING OPERATIONS.

KH0646'

KH0646'THE 1963 ROUTE DESCRIPTION WAS ADEQUATE.

KH0646'

KH0646'RECOVERED BY USAF, 1974

KH0646

KH0646 STATION RECOVERY (2007)

KH0646

KH0646'RECOVERY NOTE BY KANSAS DEPARTMENT OF TRANSPORTATION 2007
KH0646'RECOVERED IN GOOD CONDITION.

*** retrieval complete.

Elapsed Time = 00:00:02

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.8

1 National Geodetic Survey, Retrieval Date = JANUARY 3, 2016

KH0406 *****

KH0406 DESIGNATION - F 82

KH0406 PID - KH0406

KH0406 STATE/COUNTY- KS/SHERMAN

KH0406 COUNTRY - US

KH0406 USGS QUAD - GOODLAND (1974)

KH0406

KH0406 *CURRENT SURVEY CONTROL

KH0406

KH0406* NAD 83(1986) POSITION- 39 20 24. (N) 101 42 20. (W) SCALED

KH0406* NAVD 88 ORTHO HEIGHT - 1123.346 (meters) 3685.51 (feet) ADJUSTED

KH0406

KH0406 GEOID HEIGHT - -23.849 (meters) GEOID12B

KH0406 DYNAMIC HEIGHT - 1122.401 (meters) 3682.41 (feet) COMP



KH0406 MODELED GRAVITY - 979,748.0 (mgal) NAVD 88
KH0406
KH0406 VERT ORDER - SECOND CLASS 0
KH0406
KH0406.The horizontal coordinates were scaled from a topographic map and have
KH0406.an estimated accuracy of +/- 6 seconds.
KH0406.
KH0406.The orthometric height was determined by differential leveling and
KH0406.adjusted by the NATIONAL GEODETIC SURVEY
KH0406.in June 1991.
KH0406
KH0406.Significant digits in the geoid height do not necessarily reflect accuracy.
KH0406.GEOID12B height accuracy estimate available here.
KH0406
KH0406.The dynamic height is computed by dividing the NAVD 88
KH0406.geopotential number by the normal gravity value computed on the
KH0406.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
KH0406.degrees latitude (g = 980.6199 gals.).
KH0406
KH0406.The modeled gravity was interpolated from observed gravity values.
KH0406
KH0406; North East Units Estimated Accuracy
KH0406;SPC KS N - 118,290. 80,650. MT (+/- 180 meters Scaled)
KH0406
KH0406 SUPERSEDED SURVEY CONTROL
KH0406
KH0406 NGVD 29 (??/??/92) 1122.893 (m) 3684.02 (f) ADJ UNCH 2 0
KH0406
KH0406.Superseded values are not recommended for survey control.
KH0406
KH0406.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
KH0406.See file dsdata.txt to determine how the superseded data were derived.
KH0406
KH0406_U.S. NATIONAL GRID SPATIAL ADDRESS: 14SKJ668579(NAD 83)
KH0406
KH0406_MARKER: DB = BENCH MARK DISK
KH0406_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
KH0406_STAMPING: F 82 1935
KH0406_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
KH0406+STABILITY: SURFACE MOTION
KH0406_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
KH0406+SATELLITE: SATELLITE OBSERVATIONS - July 10, 2006
KH0406
KH0406 HISTORY - Date Condition Report By
KH0406 HISTORY - 1935 MONUMENTED CGS
KH0406 HISTORY - 20050718 MARK NOT FOUND INDIV
KH0406 HISTORY - 20060710 GOOD INDIV
KH0406 HISTORY - 20100516 GOOD GEOCAC
KH0406
KH0406 STATION DESCRIPTION
KH0406
KH0406'DESCRIBED BY COAST AND GEODETIC SURVEY 1935
KH0406'0.3 MI E FROM GOODLAND.



KH0406'0.3 MILE EAST ALONG THE CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD
KH0406'FROM THE STATION AT GOODLAND, SHERMAN COUNTY, AT THE CROSSING
KH0406'OF U.S. HIGHWAY 24, 45 FEET SOUTH OF THE CENTER LINE OF THE
KH0406'TRACK, 38 FEET EAST OF THE CENTER LINE OF THE HIGHWAY, 35 FEET
KH0406'SOUTHEAST OF A CROSSING-WARNING SIGNAL, AND 10 FEET EAST OF A
KH0406'POLE. A STANDARD DISK, STAMPED F 82 1935 AND SET IN THE TOP
KH0406'OF A CONCRETE POST.

KH0406

KH0406 STATION RECOVERY (2005)

KH0406

KH0406'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2005 (RLE)
KH0406'RECENT STREET AND RAILROAD CROSSING IMPROVEMENTS HAVE DEPOSITED SOIL
KH0406'OVER THE DESCRIBED MARK LOCATION. MARK IS BURIED, IF IT IS THERE AT
KH0406'ALL. ONLY REMAINING ORIGINAL REFERENCE TIE IS THE RAILROAD
KH0406'CENTERLINE.

KH0406

KH0406 STATION RECOVERY (2006)

KH0406

KH0406'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2006 (RLE)
KH0406'IN GOODLAND.
KH0406'FOUND MARK F 82 1935 IN THE SOUTHEAST QUAD OF THE INTERSECTION OF THE
KH0406'MID-STATES PORT AUTHORITY RAILROAD AND CHERRY STREET. THE MARK IS
KH0406'FLUSH WITH THE GROUND. REFERENCES FOLLOW,
KH0406'1. 49.2 FEET NORTH TO THE MAIN TRACK CENTERLINE.
KH0406'2. 32.1 FEET WEST TO THE BACK OF CURB ON THE EAST SIDE OF CHERRY
KH0406'STREET.
KH0406'3. 16.6 FEET WEST TO THE EAST EDGE OF A CONCRETE SIDEWALK.
KH0406'4. 31.6 FEET SOUTH TO THE NORTH EDGE OF A CONCRETE DRIVEWAY (PIZZA
KH0406'HUT).
KH0406'5. 100.5 FEET SOUTHWEST TO THE CENTER OF A MANHOLE IN THE SOUTHBOUND
KH0406'LANE OF CHERRY STREET.
KH0406'6. 59.54 FEET NORTHWEST TO THE SOUTH EDGE OF THE CONCRETE RAILROAD
KH0406'CROSSING APPROACH AT THE CONSTRUCTION JOINT NEAR THE CHERRY STREET
KH0406'CENTERLINE.

KH0406

KH0406 STATION RECOVERY (2010)

KH0406

KH0406'RECOVERY NOTE BY GEOCACHING 2010
KH0406'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:01

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.8

1 National Geodetic Survey, Retrieval Date = JANUARY 3, 2016

DI3134 *****

DI3134 SACS - This is a Secondary Airport Control Station.

DI3134 DESIGNATION - HLC C



DI3134 PID - DI3134
 DI3134 STATE/COUNTY- KS/GRAHAM
 DI3134 COUNTRY - US
 DI3134 USGS QUAD - HILL CITY SOUTH (1979)
 DI3134
 DI3134 *CURRENT SURVEY CONTROL
 DI3134

DI3134* NAD 83(2011) POSITION- 39 22 26.08419(N) 099 49 59.82490(W) ADJUSTED
 DI3134* NAD 83(2011) ELLIP HT- 641.695 (meters) (06/27/12) ADJUSTED
 DI3134* NAD 83(2011) EPOCH - 2010.00
 DI3134* NAVD 88 ORTHO HEIGHT - 667.19 (meters) 2188.9 (feet) GPS OBS
 DI3134

DI3134 NAVD 88 orthometric height was determined with geoid model GEOID03
 DI3134 GEOID HEIGHT - -25.471 (meters) GEOID03
 DI3134 GEOID HEIGHT - -25.502 (meters) GEOID12B
 DI3134 NAD 83(2011) X - -843,251.846 (meters) COMP
 DI3134 NAD 83(2011) Y - -4,865,055.415 (meters) COMP
 DI3134 NAD 83(2011) Z - 4,024,899.034 (meters) COMP
 DI3134 LAPLACE CORR - -1.41 (seconds) DEFLEC12B
 DI3134

DI3134 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 DI3134 Standards:

DI3134	FGDC (95% conf, cm)	Standard deviation (cm)	CorrNE
DI3134	Horiz	Ellip	SD_N SD_E SD_h (unitless)
DI3134	-----	-----	-----
DI3134	NETWORK	0.49 1.31	0.22 0.18 0.67 -0.01171551
DI3134	-----	-----	-----

DI3134 [Click here for local accuracies and other accuracy information.](#)
 DI3134
 DI3134
 DI3134.This mark is at Hill City Municipal Airport (HLC)
 DI3134
 DI3134.The horizontal coordinates were established by GPS observations
 DI3134.and adjusted by the National Geodetic Survey in June 2012.
 DI3134
 DI3134.NAD 83(2011) refers to NAD 83 coordinates where the reference
 DI3134.frame has been affixed to the stable North American tectonic plate. See
 DI3134.NA2011 for more information.
 DI3134
 DI3134.The horizontal coordinates are valid at the epoch date displayed above
 DI3134.which is a decimal equivalence of Year/Month/Day.
 DI3134
 DI3134.The orthometric height was determined by GPS observations and a
 DI3134.high-resolution geoid model.
 DI3134
 DI3134.GPS derived orthometric heights for airport stations designated as
 DI3134.PACS or SACS are published to 2 decimal places. This maintains
 DI3134.centimeter relative accuracy between the PACS and SACS. It does
 DI3134.not indicate centimeter accuracy relative to other marks which are
 DI3134.part of the NAVD 88 network.
 DI3134
 DI3134.Significant digits in the geoid height do not necessarily reflect accuracy.
 DI3134.GEOID12B height accuracy estimate available here.



DI3134

DI3134.The X, Y, and Z were computed from the position and the ellipsoidal ht.

DI3134

DI3134.The Laplace correction was computed from DEFLEC12B derived deflections.

DI3134

DI3134.The ellipsoidal height was determined by GPS observations

DI3134.and is referenced to NAD 83.

DI3134

DI3134. The following values were computed from the NAD 83(2011) position.

DI3134

DI3134;	North	East	Units	Scale	Factor	Converg.
DI3134;SPC KS N	- 117,115.757	242,045.629	MT	0.99995916	-1 09 35.8	
DI3134;SPC KS N	- 384,237.28	794,111.37	sFT	0.99995916	-1 09 35.8	
DI3134;UTM 14	- 4,358,602.479	428,225.229	MT	0.99966343	-0 31 43.1	

DI3134

DI3134! - Elev Factor x Scale Factor = Combined Factor

DI3134!SPC KS N - 0.99989933 x 0.99995916 = 0.99985850

DI3134!UTM 14 - 0.99989933 x 0.99966343 = 0.99956280

DI3134

DI3134:	Primary Azimuth Mark	Grid Az
DI3134:SPC KS N	- HLC A	003 29 25.5
DI3134:UTM 14	- HLC A	002 51 32.8

DI3134

DI3134	-----		
DI3134	PID	Reference Object	Distance Geod. Az
DI3134			dddmss.s
DI3134	DI3132	HLC A	APPROX. 0.6 KM 0021949.7
DI3134	-----		

DI3134

DI3134

SUPERSEDED SURVEY CONTROL

DI3134

DI3134	NAD 83(2007)-	39 22 26.08416(N)	099 49 59.82544(W)	AD(2002.00)	1
DI3134	ELLIP H (04/07/09)	641.696 (m)		GP(2002.00)	3 2
DI3134	NAD 83(1997)-	39 22 26.08360(N)	099 49 59.82547(W)	AD()	1
DI3134	ELLIP H (01/03/07)	641.692 (m)		GP()	3 2

DI3134

DI3134.Superseded values are not recommended for survey control.

DI3134

DI3134.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

DI3134.See file dsdata.txt to determine how the superseded data were derived.

DI3134

DI3134_U.S. NATIONAL GRID SPATIAL ADDRESS: 14SMJ2822558602(NAD 83)

DI3134

DI3134_MARKER: DD = SURVEY DISK

DI3134_SETTING: 4 = OBJECT SURROUNDED BY MASS OF CONCRETE

DI3134_STAMPING: HLC C 2006

DI3134_MARK LOGO: WOOLPT

DI3134_MAGNETIC: N = NO MAGNETIC MATERIAL

DI3134_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

DI3134_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

DI3134+SATELLITE: SATELLITE OBSERVATIONS - October 28, 2006

DI3134

DI3134 HISTORY - Date Condition Report By



DI3134 HISTORY - 20061028 MONUMENTED WOOLPT

DI3134

DI3134 STATION DESCRIPTION

DI3134

DI3134'DESCRIBED BY WOOLPERT CONSULTANTS 2006

DI3134'DESCRIBED BY WOOLPERT INC 2006 (BAJ) THE STATION IS LOCATED 1.1 MI

DI3134'(1.77 KM) NORTHEAST OF HILL CITY, KS. 65.35 MILES EAST OF COLBY, KS.

DI3134'44.5 MI (71.62 KM) NORTHWEST OF HAYES, KS. AT THE HILL CITY MUNICIPAL

DI3134'AIRPORT 205 N. POMEROY ST. HILL CITY, KS. CONTACT AIRPORT MANAGER

DI3134'DENNIS MERSCH AT (785) 421-3422 TO ARRANGE ACCESS AND OR ESCORT.

DI3134'

DI3134'TO REACH THE STATION FROM THE INTERSECTION OF US HWY 24 AND US HWY

DI3134'283, HILL CITY, KS. GO NORTH ALONG US 283 0.5 MI (0.8 KM) TO PROUT RD.

DI3134'TURN RIGHT HEADING EAST ALONG PROUT RD. 0.65 MILES TO AIRPORT RD.

DI3134'TURN LEFT HEADING NORTH 0.25 MILES ALONG AIRPORT RD. TO ENTRANCE TO

DI3134'AIRPORT. TURN RIGHT HEADING EAST FOR 100 FT (30.5 M) TO THE

DI3134'APRON. TURN RIGHT HEADING SOUTH TO THE END OF THE APRON. TURN LEFT

DI3134'0.1 MI (0.16 KM) INTO THE FEILD TO THE MARK ON THE RIGHT.

DI3134'

DI3134'THE MARK IS A BRASS AIRPORT CONTROL DISK STAMPED HLC C 2006 SET IN THE

DI3134'TOP OF A 4' CONCRETE POST. FLUSH WITH THE GROUND. ITS IS 186.00 FT

DI3134'(56.7 M) EAST SOUTHEAST THE THE SOUTHEAST CORNER OF THE APRON 231.00

DI3134'FT (70.4 M) WEST SOUTHWEST OF THE NORTHWEST CORNER OF THE AIRPLANE

DI3134'WARM UP AREA AND 2.0 FT (0.6 M) EAST OF A FIBERGLASS WITNESS POST.

DI3134'THIS STATION IS DESIGNATED AS A SECONDARY AIRPORT CONTROL STATION.

*** retrieval complete.

Elapsed Time = 00:00:03

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.8

1 National Geodetic Survey, Retrieval Date = JANUARY 3, 2016

JH0196 *****

JH0196 DESIGNATION - M 98

JH0196 PID - JH0196

JH0196 STATE/COUNTY- KS/WICHITA

JH0196 COUNTRY - US

JH0196 USGS QUAD - LEOTI (1970)

JH0196

JH0196 *CURRENT SURVEY CONTROL

JH0196

JH0196* NAD 83(1986) POSITION- 38 29 08. (N) 101 22 04. (W) SCALED

JH0196* NAVD 88 ORTHO HEIGHT - 1007.947 (meters) 3306.91 (feet) ADJUSTED

JH0196

JH0196 GEOID HEIGHT - -24.323 (meters) GEOID12B

JH0196 DYNAMIC HEIGHT - 1007.077 (meters) 3304.05 (feet) COMP

JH0196 MODELED GRAVITY - 979,730.5 (mgal) NAVD 88

JH0196

JH0196 VERT ORDER - SECOND CLASS 0



JH0196

JH0196.The horizontal coordinates were scaled from a topographic map and have
JH0196.an estimated accuracy of +/- 6 seconds.

JH0196.

JH0196.The orthometric height was determined by differential leveling and
JH0196.adjusted by the NATIONAL GEODETIC SURVEY
JH0196.in June 1991.

JH0196

JH0196.Significant digits in the geoid height do not necessarily reflect accuracy.
JH0196.GEOID12B height accuracy estimate available here.

JH0196

JH0196.The dynamic height is computed by dividing the NAVD 88
JH0196.geopotential number by the normal gravity value computed on the
JH0196.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
JH0196.degrees latitude (g = 980.6199 gals.).

JH0196

JH0196.The modeled gravity was interpolated from observed gravity values.

JH0196

JH0196; North East Units Estimated Accuracy
JH0196;SPC KS S - 605,720. 149,830. MT (+/- 180 meters Scaled)

JH0196

JH0196 SUPERSEDED SURVEY CONTROL

JH0196

JH0196 NGVD 29 (??/??/92) 1007.575 (m) 3305.69 (f) ADJ UNCH 2 0

JH0196

JH0196.Superseded values are not recommended for survey control.

JH0196

JH0196.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
JH0196.See file dsdata.txt to determine how the superseded data were derived.

JH0196

JH0196_U.S. NATIONAL GRID SPATIAL ADDRESS: 14SKH934623(NAD 83)

JH0196

JH0196_MARKER: DB = BENCH MARK DISK

JH0196_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

JH0196_STAMPING: M 98 1935

JH0196_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

JH0196+STABILITY: SURFACE MOTION

JH0196_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

JH0196+SATELLITE: SATELLITE OBSERVATIONS - December 27, 2001

JH0196

JH0196 HISTORY - Date Condition Report By

JH0196 HISTORY - 1935 MONUMENTED CGS

JH0196 HISTORY - 1940 GOOD CGS

JH0196 HISTORY - 20011227 GOOD INDIV

JH0196

JH0196 STATION DESCRIPTION

JH0196

JH0196'DESCRIBED BY COAST AND GEODETIC SURVEY 1940

JH0196'0.8 MI W FROM LEOTI.

JH0196'TO REACH FROM THE COURT HOUSE IN LEOTI, PROCEED WESTERLY ALONG
JH0196'STATE HIGHWAY NO. 25, GO 0.8 MILE. BENCH MARK IS AT THE NORTHWEST
JH0196'CORNER OF THE CROSS-INTERSECTION OF STATE HIGHWAY NO. 25 WITH
JH0196'THE MISSOURI PACIFIC RAILROAD TRACK, 85 FEET NORTHWEST OF CENTER



JH0196'OF THE CROSSING, 75 FEET WEST OF CENTER LINE OF STATE HIGHWAY
JH0196'NO. 25, 45 FEET NORTH OF CENTER LINE OF THE TRACK, 43 FEET WEST
JH0196'OF A FENCE CORNER, 498 FEET NORTH OF THE FOURTH POLE EAST OF
JH0196'MILEPOST NO. 707-30, 3.7 FEET SOUTH OF THE RIGHT-OF-WAY FENCE,
JH0196'2.5 FEET EAST OF A 4 X 4 INCH WOODEN POST PAINTED WHITE
JH0196'PROJECTING 2.0 FEET. MONUMENT PROJECTS 0.5 FOOT.

JH0196

JH0196 STATION RECOVERY (2001)

JH0196

JH0196'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2001 (RLE)

JH0196'THE HIGHWAY ALIGNMENT REFERENCING THE MARK LOCATION HAS CHANGED. HERE
JH0196'IS A NEW DESCRIPTION.

JH0196'FROM THE INTERSECTION OF KS 96 HWY AND KS 25 HWY NEAR THE CENTER OF
JH0196'LEOTI, GO 0.5 MILES WEST ON KS 96 HWY TO INDIAN ROAD. GO 0.3 MILES
JH0196'NORTH ON INDIAN ROAD TO THE KANSAS AND OKLAHOMA RAILROAD CROSSING AND
JH0196'THE MARK NORTHWEST OF THE RAILROAD CROSSING AND INDIAN ROAD.

JH0196'MARK IS 85 FEET NORTHWEST OF THE CENTER OF THE CROSSING. 75 FEET WEST
JH0196'OF THE CENTERLINE OF INDIAN ROAD. 45 FEET NORTH OF THE CENTERLINE OF
JH0196'THE KANSAS AND OKLAHOMA RAILROAD. 43 FEET WEST OF A LONE CORNER POST.
JH0196'1 FOOT SOUTH OF A METAL WITNESS POST. 1.5 FEET BELOW THE SURFACE OF
JH0196'WIND-BLOWN MATERIAL IN AN OLD FENCE ROW.

*** retrieval complete.

Elapsed Time = 00:00:01

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.8

1 National Geodetic Survey, Retrieval Date = JANUARY 3, 2016

KH0609 *****

KH0609 DESIGNATION - SYF A

KH0609 PID - KH0609

KH0609 STATE/COUNTY- KS/CHEYENNE

KH0609 COUNTRY - US

KH0609 USGS QUAD - ST FRANCIS (1978)

KH0609

KH0609 *CURRENT SURVEY CONTROL

KH0609

KH0609* NAD 83(1997) POSITION- 39 45 42.72138(N) 101 47 46.84543(W) ADJUSTED

KH0609* NAVD 88 ORTHO HEIGHT - 1037.993 (meters) 3405.48 (feet) ADJUSTED

KH0609

KH0609 LAPLACE CORR - -2.52 (seconds) DEFLEC12B

KH0609 GEOID HEIGHT - -23.300 (meters) GEOID12B

KH0609 DYNAMIC HEIGHT - 1037.187 (meters) 3402.84 (feet) COMP

KH0609 MODELED GRAVITY - 979,814.5 (mgal) NAVD 88

KH0609

KH0609 HORZ ORDER - THIRD

KH0609 VERT ORDER - THIRD

KH0609

KH0609.This mark is at Cheyenne Co Municipal Airport (SYF)

KH0609



KH0609.The horizontal coordinates were established by classical geodetic methods
KH0609.and adjusted by the National Geodetic Survey in October 1998.

KH0609.

KH0609.The orthometric height was determined by differential leveling and
KH0609.adjusted by the NATIONAL GEODETIC SURVEY

KH0609.in June 1991.

KH0609

KH0609.Significant digits in the geoid height do not necessarily reflect accuracy.

KH0609.GEOID12B height accuracy estimate available here.

KH0609

KH0609.The Laplace correction was computed from DEFLEC12B derived deflections.

KH0609

KH0609.The dynamic height is computed by dividing the NAVD 88

KH0609.geopotential number by the normal gravity value computed on the

KH0609.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

KH0609.degrees latitude (g = 980.6199 gals.).

KH0609

KH0609.The modeled gravity was interpolated from observed gravity values.

KH0609

KH0609. The following values were computed from the NAD 83(1997) position.

KH0609

KH0609; North East Units Scale Factor Converg.

KH0609;SPC KS N - 165,406.800 74,788.453 MT 0.99999659 -2 24 07.2

KH0609;SPC KS N - 542,672.14 245,368.45 sFT 0.99999659 -2 24 07.2

KH0609;UTM 14 - 4,405,067.690 260,460.174 MT 1.00030647 -1 47 21.8

KH0609

KH0609! - Elev Factor x Scale Factor = Combined Factor

KH0609!SPC KS N - 0.99984084 x 0.99999659 = 0.99983743

KH0609!UTM 14 - 0.99984084 x 1.00030647 = 1.00014726

KH0609

KH0609: Primary Azimuth Mark Grid Az

KH0609:SPC KS N - ST FRANCIS MUNICIPAL TANK 003 08 26.4

KH0609:UTM 14 - ST FRANCIS MUNICIPAL TANK 002 31 41.0

KH0609

KH0609|-----|

KH0609| PID Reference Object Distance Geod. Az |

KH0609| dddmmss.s |

KH0609| KH0719 ST FRANCIS MUNICIPAL TANK APPROX. 1.0 KM 0004419.2 |

KH0609| KH0836 ST FRANCIS AIRPORT BEACON 357.087 METERS 32858 |

KH0609|-----|

KH0609

KH0609 SUPERSEDED SURVEY CONTROL

KH0609

KH0609 NAD 83(1995)- 39 45 42.72122(N) 101 47 46.84531(W) AD() 3

KH0609 NAD 83(1986)- 39 45 42.72041(N) 101 47 46.84682(W) AD() 3

KH0609 NAD 27 - 39 45 42.74586(N) 101 47 45.22322(W) AD() 3

KH0609 NGVD 29 (12/08/88) 1037.56 (m) 3404.1 (f) LEVELING 3

KH0609

KH0609.Superseded values are not recommended for survey control.

KH0609

KH0609.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

KH0609.See file dsdata.txt to determine how the superseded data were derived.

KH0609



KH0609_U.S. NATIONAL GRID SPATIAL ADDRESS: 14SKK6046005067(NAD 83)

KH0609

KH0609_MARKER: DD = SURVEY DISK

KH0609_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

KH0609_STAMPING: SYF A 1987

KH0609_MARK LOGO: NOSAMC

KH0609_MAGNETIC: N = NO MAGNETIC MATERIAL

KH0609_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

KH0609+STABILITY: SURFACE MOTION

KH0609_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

KH0609+SATELLITE: SATELLITE OBSERVATIONS - October 08, 2008

KH0609

KH0609 HISTORY - Date Condition Report By

KH0609 HISTORY - 1987 MONUMENTED NOS

KH0609 HISTORY - 1987 GOOD NOS

KH0609 HISTORY - 20081008 GOOD INDIV

KH0609

KH0609 STATION DESCRIPTION

KH0609

KH0609'DESCRIBED BY NATIONAL OCEAN SERVICE 1987 (REM)

KH0609'THE STATION IS LOCATED AT THE ST FRANCIS CHEYENNE COUNTY MUNICIPAL

KH0609'AIRPORT NEAR THE WINDSOCK AT THE HIGHEST ELEVATION OF THE AIRPORT.

KH0609'

KH0609'THE MARK IS LOCATED ON THE AIRPORT. SEE AIRPORT MANAGER.

KH0609'

KH0609'THE MARK IS A STANDARD NOS DISK STAMPED---SYF A 1987---SET IN TOP OF

KH0609'A 10 INCH ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND.

KH0609'THE STATION IS 8.08 METERS (26.5 FT) EAST OF THE WINDSOCK.

KH0609'

KH0609'HEIGHT OF LIGHT SHOWN WAS 1.5 METERS ABOVE THE MARK.

KH0609'

KH0609'DESCRIBED BY JDS

KH0609

KH0609 STATION RECOVERY (1987)

KH0609

KH0609'RECOVERY NOTE BY NATIONAL OCEAN SERVICE 1987

KH0609'IN ST FRANCIS.

KH0609'THE STATION IS A STANDARD NOS ALUMINUM DISK SET INTO THE TOP OF A 10

KH0609'INCH DIAMETER CONCRETE MONUMENT FLUSH WITH THE GROUND.IT IS LOCATED

KH0609'26.5 FEET EAST OF THE WINDSOCK. CONTACT THE AIRPORT MANAGER PRIOR TO

KH0609'ENTERING THE AIRPORT PROPER.

KH0609

KH0609 STATION RECOVERY (2008)

KH0609

KH0609'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2008 (TDW)

KH0609'RECOVERD AS DESCRIBED

*** retrieval complete.

Elapsed Time = 00:00:01



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

PROGRAM = datasheet95, VERSION = 8.8

1 National Geodetic Survey, Retrieval Date = JANUARY 3, 2016

KH0235 *****

KH0235 DESIGNATION - X 155

KH0235 PID - KH0235

KH0235 STATE/COUNTY- KS/DECATUR

KH0235 COUNTRY - US

KH0235 USGS QUAD - OBERLIN (1965)

KH0235

KH0235 *CURRENT SURVEY CONTROL

KH0235

KH0235* NAD 83(1986) POSITION- 39 45 34.77 (N) 100 30 57.58 (W) HD_HELD1

KH0235* NAVD 88 ORTHO HEIGHT - 844.496 (meters) 2770.65 (feet) ADJUSTED

KH0235

KH0235 GEOID HEIGHT - -24.567 (meters) GEOID12B

KH0235 DYNAMIC HEIGHT - 843.887 (meters) 2768.65 (feet) COMP

KH0235 MODELED GRAVITY - 979,876.9 (mgal) NAVD 88

KH0235

KH0235 VERT ORDER - SECOND CLASS 0

KH0235

KH0235.The horizontal coordinates were determined by differentially corrected

KH0235.hand held GPS observations or other comparable positioning techniques

KH0235.and have an estimated accuracy of +/- 3 meters.

KH0235.

KH0235.The orthometric height was determined by differential leveling and

KH0235.adjusted by the NATIONAL GEODETIC SURVEY

KH0235.in June 1991.

KH0235

KH0235.Significant digits in the geoid height do not necessarily reflect accuracy.

KH0235.GEOID12B height accuracy estimate available here.

KH0235

KH0235.The dynamic height is computed by dividing the NAVD 88

KH0235.geopotential number by the normal gravity value computed on the

KH0235.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

KH0235.degrees latitude (g = 980.6199 gals.).

KH0235

KH0235.The modeled gravity was interpolated from observed gravity values.

KH0235

KH0235; North East Units Estimated Accuracy

KH0235;SPC KS N - 161,338.6 184,426.7 MT (+/- 3 meters HH1 GPS)

KH0235

KH0235 SUPERSEDED SURVEY CONTROL

KH0235

KH0235 NGVD 29 (??/??/92) 844.179 (m) 2769.61 (f) ADJ UNCH 2 0

KH0235

KH0235.Superseded values are not recommended for survey control.

KH0235

KH0235.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

KH0235.See file dsdata.txt to determine how the superseded data were derived.

KH0235

KH0235_U.S. NATIONAL GRID SPATIAL ADDRESS: 14SLK7013902181(NAD 83)



KH0235

KH0235_MARKER: DB = BENCH MARK DISK

KH0235_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

KH0235_STAMPING: X 155 1934

KH0235_MARK LOGO: CGS

KH0235_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

KH0235+STABILITY: SURFACE MOTION

KH0235_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

KH0235+SATELLITE: SATELLITE OBSERVATIONS - July 29, 2009

KH0235

KH0235 HISTORY - Date Condition Report By

KH0235 HISTORY - 1934 MONUMENTED CGS

KH0235 HISTORY - 1949 GOOD USGS

KH0235 HISTORY - 1980 GOOD LOCSUR

KH0235 HISTORY - 1987 GOOD NOS

KH0235 HISTORY - 20090729 GOOD INDIV

KH0235

KH0235 STATION DESCRIPTION

KH0235

KH0235'DESCRIBED BY US GEOLOGICAL SURVEY 1949

KH0235'6.8 MI S FROM OBERLIN.

KH0235'ABOUT 4.25 MI. S. AND 0.6 MI. E. FROM THE COURT HOUSE AT OBERLIN,

KH0235'ABOUT 100 FT. NE OF THE FOUNDATION ON SITE OF FORMER FAIRVIEW

KH0235'SCHOOL (BUILDINGS ALL REMOVED) ABOUT 0.25 MI. N. OF COR. SECS.

KH0235'25-30-31-36, T. 3S., RS. 28-29W., 18 FT. W. OF CENTER LINE OF

KH0235'RD., 2 FT. E. OF FENCE LINE, IN A CONCRETE POST, A STD. DISK

KH0235'STAMPED X 155 1934.

KH0235

KH0235 STATION RECOVERY (1980)

KH0235

KH0235'RECOVERY NOTE BY LOCAL SURVEYOR (INDIVIDUAL OR FIRM) 1980

KH0235'RECOVERED IN GOOD CONDITION.

KH0235

KH0235 STATION RECOVERY (1987)

KH0235

KH0235'RECOVERY NOTE BY NATIONAL OCEAN SERVICE 1987

KH0235'RECOVERED IN GOOD CONDITION.

KH0235

KH0235 STATION RECOVERY (2009)

KH0235

KH0235'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2009 (CRB)

KH0235'FENCE LINE HAVE BEEN REMOVED. SURVEY WITNESS MARKER POST HAS BEEN

KH0235'REMOVED BUT THE SIGN REMAINS ON THE EAST SIDE OF CONCRETE MARKER.

*** retrieval complete.

Elapsed Time = 00:00:02

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.8

1 National Geodetic Survey, Retrieval Date = JANUARY 3, 2016



KH0295 *****

KH0295 DESIGNATION - Z 77

KH0295 PID - KH0295

KH0295 STATE/COUNTY- KS/RAWLINS

KH0295 COUNTRY - US

KH0295 USGS QUAD - CHARDON (1978)

KH0295

KH0295 *CURRENT SURVEY CONTROL

KH0295

KH0295* NAD 83(1986) POSITION- 39 44 48.12 (N) 101 02 16.37 (W) HD_HELD1

KH0295* NAVD 88 ORTHO HEIGHT - 947.691 (meters) 3109.22 (feet) ADJUSTED

KH0295

KH0295 GEOID HEIGHT - -24.106 (meters) GEOID12B

KH0295 DYNAMIC HEIGHT - 946.986 (meters) 3106.90 (feet) COMP

KH0295 MODELED GRAVITY - 979,850.4 (mgal) NAVD 88

KH0295

KH0295 VERT ORDER - SECOND CLASS 0

KH0295

KH0295.The horizontal coordinates were determined by differentially corrected
KH0295.hand held GPS observations or other comparable positioning techniques
KH0295.and have an estimated accuracy of +/- 3 meters.

KH0295.

KH0295.The orthometric height was determined by differential leveling and
KH0295.adjusted by the NATIONAL GEODETIC SURVEY

KH0295.in June 1991.

KH0295

KH0295.Significant digits in the geoid height do not necessarily reflect accuracy.

KH0295.GEOID12B height accuracy estimate available here.

KH0295

KH0295.The dynamic height is computed by dividing the NAVD 88

KH0295.geopotential number by the normal gravity value computed on the

KH0295.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

KH0295.degrees latitude (g = 980.6199 gals.).

KH0295

KH0295.The modeled gravity was interpolated from observed gravity values.

KH0295

KH0295; North East Units Estimated Accuracy

KH0295;SPC KS N - 161,271.9 139,678.0 MT (+/- 3 meters HH1 GPS)

KH0295

KH0295 SUPERSEDED SURVEY CONTROL

KH0295

KH0295 NGVD 29 (??/??/92) 947.344 (m) 3108.08 (f) ADJ UNCH 2 0

KH0295

KH0295.Superseded values are not recommended for survey control.

KH0295

KH0295.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

KH0295.See file dsdata.txt to determine how the superseded data were derived.

KH0295

KH0295_U.S. NATIONAL GRID SPATIAL ADDRESS: 14SLK2539901629(NAD 83)

KH0295

KH0295_MARKER: DB = BENCH MARK DISK

KH0295_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

KH0295_STAMPING: Z-77 1934



KH0295_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
KH0295+STABILITY: SURFACE MOTION
KH0295_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
KH0295+SATELLITE: SATELLITE OBSERVATIONS - July 07, 2008

KH0295

KH0295 HISTORY - Date Condition Report By
KH0295 HISTORY - 1934 MONUMENTED CGS
KH0295 HISTORY - 20080707 GOOD WOOLPT

KH0295

KH0295 STATION DESCRIPTION

KH0295

KH0295'DESCRIBED BY COAST AND GEODETIC SURVEY 1934
KH0295'4.6 MI S FROM ATWOOD.
KH0295'4.6 MILES S OF AND ALONG STATE HWY 25. 36 FT W OF CENTER OF
KH0295'HIGHWAY, 7 FT W OF R/W FENCE.

KH0295

KH0295 STATION RECOVERY (2008)

KH0295

KH0295'RECOVERY NOTE BY WOOLPERT CONSULTANTS 2008 (DJK)
KH0295'RECOVERED IN GOOD CONDITION

*** retrieval complete.
Elapsed Time = 00:00:02

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.8

1 National Geodetic Survey, Retrieval Date = JANUARY 3, 2016

KH0041 *****

KH0041 DESIGNATION - Z 151
KH0041 PID - KH0041
KH0041 STATE/COUNTY- KS/SHERIDAN
KH0041 COUNTRY - US
KH0041 USGS QUAD - MIDWAY DRAW WEST (1979)
KH0041
KH0041 *CURRENT SURVEY CONTROL

KH0041

KH0041* NAD 83(1986) POSITION- 39 14 04. (N) 100 27 40. (W) SCALED
KH0041* NAVD 88 ORTHO HEIGHT - 841.345 (meters) 2760.31 (feet) ADJUSTED

KH0041

KH0041 GEOID HEIGHT - -25.157 (meters) GEOID12B
KH0041 DYNAMIC HEIGHT - 840.695 (meters) 2758.18 (feet) COMP
KH0041 MODELED GRAVITY - 979,826.2 (mgal) NAVD 88

KH0041

KH0041 VERT ORDER - SECOND CLASS 0

KH0041

KH0041.The horizontal coordinates were scaled from a topographic map and have
KH0041.an estimated accuracy of +/- 6 seconds.

KH0041.

KH0041.The orthometric height was determined by differential leveling and
KH0041.adjusted by the NATIONAL GEODETIC SURVEY



KH0041.in June 1991.

KH0041

KH0041.Significant digits in the geoid height do not necessarily reflect accuracy.

KH0041.GEOID12B height accuracy estimate available here.

KH0041

KH0041.The dynamic height is computed by dividing the NAVD 88

KH0041.geopotential number by the normal gravity value computed on the

KH0041.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

KH0041.degrees latitude (g = 980.6199 gals.).

KH0041

KH0041.The modeled gravity was interpolated from observed gravity values.

KH0041

KH0041; North East Units Estimated Accuracy

KH0041;SPC KS N - 102,920. 187,540. MT (+/- 180 meters Scaled)

KH0041

KH0041 SUPERSEDED SURVEY CONTROL

KH0041

KH0041 NGVD 29 (??/??/92) 841.026 (m) 2759.27 (f) ADJ UNCH 2 0

KH0041

KH0041.Superseded values are not recommended for survey control.

KH0041

KH0041.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

KH0041.See file dsdata.txt to determine how the superseded data were derived.

KH0041

KH0041_U.S. NATIONAL GRID SPATIAL ADDRESS: 14SLJ738438(NAD 83)

KH0041

KH0041_MARKER: DB = BENCH MARK DISK

KH0041_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

KH0041_STAMPING: Z 151 1934

KH0041_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

KH0041+STABILITY: SURFACE MOTION

KH0041_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

KH0041+SATELLITE: SATELLITE OBSERVATIONS - November 19, 2013

KH0041

KH0041 HISTORY - Date Condition Report By

KH0041 HISTORY - 1934 MONUMENTED CGS

KH0041 HISTORY - 1942 GOOD CGS

KH0041 HISTORY - 20131119 GOOD INDIV

KH0041

KH0041 STATION DESCRIPTION

KH0041

KH0041'DESCRIBED BY COAST AND GEODETIC SURVEY 1934

KH0041'8.6 MI S FROM HOXIE.

KH0041'8.6 MILES SOUTH OF UNION PACIFIC STATION AT HOXIE ABOUT 500 FEET

KH0041'NORTH OF MIDWAY SCHOOL HOUSE, IN SOUTHEAST END OF CONCRETE BRIDGE

KH0041'ON STATE HIGHWAY 23.

KH0041

KH0041 STATION RECOVERY (1942)

KH0041

KH0041'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1942

KH0041'RECOVERED IN GOOD CONDITION.

KH0041

KH0041 STATION RECOVERY (2013)



KH0041

KH0041'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2013 (CRB)
KH0041'8.5 MILES SOUTH AND 1.0 MILES WEST OF THE INTERSECTION OF US HWY 24
KH0041'AND STATE HIGHWAY 23 AT HOXIE. 70 FEET NORTH AND 14 FEET EAST OF THE
KH0041'INTERSECTION OF COUNTY ROAD 90S AND COUNTY ROAD 10W, IN THE SOUTHEAST
KH0041'CORNER OF THE CONCRETE BRIDGE UNDER COUNTY ROAD 10W. STATE HIGHWAY 23
KH0041'HAS BEEN RELOCATED 1 MILE EAST OF MONUMENT LOCATION AND MIDWAY SCHOOL
KH0041'HOUSE HAS BEEN REMOVED. GPS COORDS 39D 14M 05.0S N ,100D 27M 41.2S W

*** retrieval complete.
Elapsed Time = 00:00:02

1.2 Primary Control Network Survey Minimally Constrained Adjustment Report

```
*****
* NETWORK - WEIGHTED GNSS NETWORK ADJUSTMENT *
*
* (c) Copyright NovAtel Inc., (2015) *
*
* Version: 8.60.4331 *
*
* FILE:
V:\2015\15164_2016_Kansas_LiDAR\400_Working\402_Survey\06_Control_Network\15164_North_Network_2\15164_North_Network.net
*****
```

DATE(m/d/y): Tue. 2/16/16 TIME: 13:04:57

```
*****
DATUM: 'NAD83(2011)'
SCALE_FACTOR: 1.8809
CONFIDENCE LEVEL: 95.00 % (Scale factor is 2.4479)
*****
```

```
*****
INPUT CONTROL/CHECK POINTS
*****
```

STA_ID	TYPE	-- LATITUDE --	-- LONGITUDE --	ELLHGT	HZ-SD	V-SD
A20	CHK-VT		1077.535			
DUSTY	CHK-HZ	39 19 21.17845	-101 08 26.00988			
F82	CHK-VT		1099.497			
HLC_C	CHK-3D	39 22 26.08414	-99 49 59.82524	641.698		
M98	CHK-VT		983.743			
NEMC	GCP-3D	40 11 57.84817	-100 34 41.39506	740.679	0.00500	0.00500
SYFA	CHK-3D	39 45 42.72606	-101 47 46.83972	1014.678		
X_155	CHK-VT		819.754			
Z151	CHK-VT		816.186			
Z77	CHK-VT		923.585			



INPUT VECTORS

```
SESSION NAME      VECTOR(m)  ----- Covariance (m) [unscaled] -----
                  DX/DY/DZ      standard deviations in brackets
A20 to ATL01 (1)  52152.2133 1.0271e-004 (0.0101)
                  -13527.3002 8.0798e-005 3.5485e-004 (0.0188)
                  -3868.1635 -3.1924e-005 -1.5960e-004 2.1341e-004 (0.0146)

A20 to ATL01 (2)  52152.1911 1.7266e-004 (0.0131)
                  -13527.3291 1.5359e-004 4.3882e-004 (0.0209)
                  -3868.1320 -1.7573e-004 -3.2907e-004 1.4808e-003 (0.0385)

ATL02 to ATL01 (1) -54175.3709 1.3081e-004 (0.0114)
                  7886.3428 1.1418e-004 3.7370e-004 (0.0193)
                  -2807.1696 -2.8430e-005 -1.3366e-004 2.2519e-004 (0.0150)

ATL02 to ATL01 (2) -54175.3498 8.9235e-005 (0.0094)
                  7886.3052 1.1457e-005 3.7433e-004 (0.0193)
                  -2807.1289 2.6283e-005 -2.2852e-004 3.2397e-004 (0.0180)

A20 to ATL03 (1)  -5833.5547 1.6856e-004 (0.0130)
                  -27734.6926 1.2131e-004 5.2601e-004 (0.0229)
                  -35435.7354 -7.8930e-006 -1.9059e-004 2.2607e-004 (0.0150)

ATL03 to ATL01 (1) 57985.7427 2.0265e-004 (0.0142)
                  14207.3521 2.6183e-004 7.3441e-004 (0.0271)
                  31567.6255 -1.1035e-004 -3.3849e-004 3.4506e-004 (0.0186)

ATL03 to M98 (1)  33307.4359 1.1168e-004 (0.0106)
                  -4311.6502 7.8608e-005 2.7936e-004 (0.0167)
                  2936.5712 -9.4731e-006 -1.0764e-004 1.8607e-004 (0.0136)

ATL03 to M98 (2)  33307.4088 9.9158e-005 (0.0100)
                  -4311.6340 8.6510e-005 3.5923e-004 (0.0190)
                  2936.5988 -4.2963e-005 -2.4429e-004 3.9329e-004 (0.0198)

DUSTY to ATL01 (1) -6044.7707 7.3542e-005 (0.0086)
                  -34871.7721 6.6734e-005 3.3739e-004 (0.0184)
                  -43679.1446 -2.8382e-005 -1.3272e-004 2.3528e-004 (0.0153)

DUSTY to F82 (1)  -47516.0673 8.6785e-005 (0.0093)
                  10775.2002 3.9388e-005 3.3151e-004 (0.0182)
                  1593.5201 -1.3208e-005 -1.4618e-004 2.3003e-004 (0.0152)

SYFA to DUSTY (1)  49084.9485 1.7104e-004 (0.0131)
                  -41620.8689 -9.1502e-005 8.7193e-004 (0.0295)
                  -37641.5829 2.3807e-005 -2.8159e-004 2.8640e-004 (0.0169)

DUSTY to X_155 (1) 58568.2952 1.1334e-004 (0.0106)
                  20382.7468 5.5781e-005 3.7282e-004 (0.0193)
                  37327.5166 -7.7144e-006 -1.5020e-004 2.2845e-004 (0.0151)

DUSTY to Z151 (1)  56435.4030 1.2215e-004 (0.0111)
                  -16924.2185 1.0602e-004 3.7126e-004 (0.0193)
                  -7654.3838 -5.8322e-005 -2.1313e-004 3.0241e-004 (0.0174)

DUSTY to Z151 (2)  56435.4201 7.2480e-005 (0.0085)
                  -16924.2720 2.5970e-005 2.9595e-004 (0.0172)
                  -7654.3397 -4.0127e-006 -1.2001e-004 1.8073e-004 (0.0134)

DUSTY to Z77 (1)  14438.0685 1.0132e-004 (0.0101)
                  27764.5595 6.7832e-005 3.1987e-004 (0.0179)
```

36287.5693 -7.5032e-006 -1.2690e-004 2.0498e-004 (0.0143)

DUSTY to Z77 (2) 14438.0757 1.0275e-004 (0.0101)
27764.5815 7.5249e-005 3.1837e-004 (0.0178)
36287.5560 -1.8610e-005 -1.4060e-004 2.2810e-004 (0.0151)

F82 to ATL01 (1) 41471.2753 1.2281e-004 (0.0111)
-45647.0103 9.5781e-005 4.5343e-004 (0.0213)
-45272.6272 -3.9683e-005 -2.2566e-004 2.7683e-004 (0.0166)

F82 to A20 (1) -10680.9394 1.1935e-004 (0.0109)
-32119.7660 9.6778e-005 3.6307e-004 (0.0191)
-41404.4621 -3.2313e-005 -1.9517e-004 2.9001e-004 (0.0170)

SYFA to F82 (1) 1568.8950 1.0209e-004 (0.0101)
-30845.6626 1.2728e-005 4.2224e-004 (0.0205)
-36048.0644 7.9701e-006 -1.5537e-004 2.1423e-004 (0.0146)

F82 to Z77 (1) 61954.1027 2.1932e-004 (0.0148)
16989.3063 2.3014e-004 4.7642e-004 (0.0218)
34694.0859 -1.3486e-004 -2.8573e-004 3.9639e-004 (0.0199)

HLC_C to ATL02 (1) -63391.7658 1.0512e-003 (0.0324)
-26058.2000 -3.1946e-004 1.5478e-003 (0.0393)
-45067.7037 1.2034e-004 -5.5736e-004 5.1432e-004 (0.0227)

HLC_C to Z151 (1) -55087.0342 8.3732e-005 (0.0092)
-224.2472 -3.6383e-005 1.0878e-004 (0.0104)
-11850.1235 8.3333e-006 -2.7639e-005 3.2000e-005 (0.0057)

M98 to A20 (1) -27473.8445 2.3778e-004 (0.0154)
32046.3226 3.2073e-004 1.2395e-003 (0.0352)
32499.1555 -5.8388e-005 -3.9522e-004 2.9295e-004 (0.0171)

M98 to ATL01 (1) 24678.3486 9.8339e-005 (0.0099)
18519.0167 7.1498e-005 3.5540e-004 (0.0189)
28631.0206 -2.5754e-005 -1.7700e-004 3.2206e-004 (0.0179)

ATL02 to M98 (1) -78853.6818 1.4087e-004 (0.0119)
-10632.7384 5.0796e-005 7.4646e-004 (0.0273)
-31438.1015 4.1262e-005 -5.1844e-004 6.6575e-004 (0.0258)

NEMC to HLC_C (1) 52421.4404 1.0873e-004 (0.0104)
-68960.6772 9.5819e-005 4.0302e-004 (0.0201)
-70500.7975 -9.1923e-005 -3.1160e-004 5.6705e-004 (0.0238)

NEMC to SYFA (1) -108185.9367 1.7469e-004 (0.0132)
-10639.5873 7.4116e-006 7.3404e-004 (0.0271)
-37054.9764 4.5202e-005 -3.3027e-004 3.6615e-004 (0.0191)

NEMC to X_155 (1) -532.7081 8.6452e-005 (0.0093)
-31877.7535 6.8561e-005 3.3232e-004 (0.0182)
-37369.0077 -2.9920e-005 -1.8714e-004 2.9037e-004 (0.0170)

NEMC to Z77 (1) -44662.9130 1.0788e-004 (0.0104)
-24495.9096 8.4095e-005 3.8046e-004 (0.0195)
-38408.9823 -2.4173e-005 -2.3948e-004 3.7433e-004 (0.0193)

SYFA to Z77 (1) 63523.0129 1.0717e-004 (0.0104)
-13856.3526 1.0378e-004 3.4352e-004 (0.0185)
-1353.9893 -2.6985e-005 -1.6997e-004 2.9334e-004 (0.0171)

X_155 to Z151 (1) -2132.8674 9.6725e-005 (0.0098)
-37306.9470 6.7462e-005 4.2290e-004 (0.0206)
-44981.9172 -3.3476e-005 -3.1659e-004 4.4857e-004 (0.0212)



X_155 to Z77 (1) -44130.2016 1.0721e-004 (0.0104)
7381.8453 5.2456e-005 3.4199e-004 (0.0185)
-1039.9639 -1.2275e-005 -1.4303e-004 2.1830e-004 (0.0148)

Z151 to ATL01 (1) -62480.1599 7.3599e-005 (0.0086)
-17947.5053 5.3155e-005 3.1443e-004 (0.0177)
-36024.7801 -3.1147e-005 -1.3642e-004 2.6067e-004 (0.0161)

Z151 to ATL02 (1) -8304.8277 6.3186e-005 (0.0079)
-25833.8487 5.0020e-005 2.7108e-004 (0.0165)
-33217.6294 -3.3594e-006 -1.0328e-004 3.3252e-004 (0.0182)

Z151 to Z77 (1) -41997.3194 1.2679e-004 (0.0113)
44688.8066 1.3070e-004 8.2655e-004 (0.0287)
43941.9365 -1.3138e-004 -8.3670e-004 1.1638e-003 (0.0341)

OUTPUT VECTOR RESIDUALS (East, North, Height - Local Level)

SESSION NAME	-- RE --	-- RN --	-- RH --	- PPM -	DIST -	STD -
(m)	(m)	(m)	(km)	(m)		
A20 to ATL01 (1)	-0.0085	0.0098	0.0061	0.265	54.0	0.0355
A20 to ATL01 (2)	0.0075	0.0058	-0.0392	0.746	54.0	0.0627
ATL02 to ATL01 (1)	0.0196	0.0117	0.0190	0.541	54.8	0.0370
ATL02 to ATL01 (2)	-0.0082	0.0007	-0.0322	0.607	54.8	0.0385
A20 to ATL03 (1)	-0.0041	-0.0008	-0.0138	0.318	45.4	0.0416
ATL03 to ATL01 (1)	0.0123	-0.0034	-0.0484	0.741	67.5	0.0491
ATL03 to M98 (1)	-0.0191	0.0144	0.0053	0.728	33.7	0.0329
ATL03 to M98 (2)	0.0107	-0.0137	-0.0037	0.526	33.7	0.0400
DUSTY to ATL01 (1)	0.0013	0.0009	0.0192	0.343	56.2	0.0349
DUSTY to F82 (1)	0.0090	0.0102	-0.0445	0.955	48.7	0.0349
SYFA to DUSTY (1)	0.0051	-0.0147	0.0430	0.613	74.6	0.0500
DUSTY to X_155 (1)	-0.0112	0.0025	0.0178	0.292	72.4	0.0367
DUSTY to Z151 (1)	0.0075	-0.0103	0.0496	0.861	59.4	0.0387
DUSTY to Z151 (2)	-0.0193	-0.0132	-0.0165	0.483	59.4	0.0321
DUSTY to Z77 (1)	0.0029	0.0079	-0.0132	0.326	47.9	0.0343
DUSTY to Z77 (2)	0.0001	0.0035	0.0130	0.282	47.9	0.0349
F82 to ATL01 (1)	0.0057	-0.0121	0.0080	0.203	76.5	0.0401
F82 to A20 (1)	0.0044	0.0117	-0.0419	0.817	53.5	0.0381
SYFA to F82 (1)	0.0018	-0.0086	0.0063	0.227	47.5	0.0373
F82 to Z77 (1)	0.0157	0.0065	-0.0372	0.560	73.0	0.0453
HLC_C to ATL02 (1)	-0.1234	0.0372	-0.1167	2.120	82.0	0.0765
HLC_C to Z151 (1)	-0.0180	0.0191	-0.0267	0.665	56.3	0.0205
M98 to A20 (1)	-0.0168	0.0010	0.0042	0.326	53.3	0.0577
M98 to ATL01 (1)	-0.0067	-0.0055	-0.0152	0.415	42.1	0.0382
ATL02 to M98 (1)	-0.0230	-0.0168	-0.0652	0.831	85.6	0.0540
NEMC to HLC_C (1)	-0.0058	0.0777	-0.0580	0.870	111.7	0.0450
NEMC to SYFA (1)	0.0014	-0.0186	0.0269	0.285	114.8	0.0490
NEMC to X_155 (1)	0.0009	-0.0284	0.0299	0.839	49.1	0.0365
NEMC to Z77 (1)	-0.0003	-0.0242	0.0431	0.775	63.8	0.0403
SYFA to Z77 (1)	0.0033	0.0021	-0.0189	0.296	65.0	0.0374
X_155 to Z151 (1)	-0.0026	-0.0144	0.0599	1.054	58.5	0.0427
X_155 to Z77 (1)	-0.0044	-0.0052	0.0080	0.234	44.8	0.0354
Z151 to ATL01 (1)	-0.0107	-0.0055	0.0206	0.322	74.3	0.0349
Z151 to ATL02 (1)	0.0076	0.0024	0.0075	0.254	42.9	0.0354
Z151 to Z77 (1)	-0.0139	0.0115	-0.0283	0.445	75.4	0.0631

RMS 0.0233 0.0185 0.0368

§ - This session is flagged as a 3-sigma outlier



CHECK POINT RESIDUALS (East, North, Height - Local Level)

STA. NAME	-- RE --	-- RN --	-- RH --
	(m)	(m)	(m)
A20		-0.0214	
DUSTY	0.0015	-0.0174	
F82		-0.0126	
HLC_C	0.1608	-0.0864	0.0701
M98		-0.0275	
SYFA	0.0015	-0.0265	-0.0112
X_155		-0.0328	
Z151		-0.0000	
Z77		-0.0193	

RMS	0.0928	0.0531	0.0314

CONTROL POINT RESIDUALS (ADJUSTMENT MADE)

STA. NAME	-- RE --	-- RN --	-- RH --
	(m)	(m)	(m)
NEMC	0.0000	0.0000	0.0000

RMS	0.0000	0.0000	0.0000

OUTPUT STATION COORDINATES (LAT/LONG/HT)

STA_ID	-- LATITUDE --	-- LONGITUDE --	ELLHGT -
A20	38 51 35.56350	-101 45 02.92671	1077.5137
ATL01	38 48 58.62603	-101 07 52.56630	921.2239
ATL02	38 50 58.74125	-100 30 05.26984	795.9651
ATL03	38 27 04.29155	-101 45 05.52346	1075.3325
DUSTY	39 19 21.17789	-101 08 26.00982	979.9916
F82	39 20 24.79460	-101 42 19.44036	1099.4843
HLC_C	39 22 26.08134	-99 49 59.81852	641.7681
M98	38 29 08.26946	-101 22 04.01076	983.7155
NEMC	40 11 57.84817	-100 34 41.39506	740.6790
SYFA	39 45 42.72520	-101 47 46.83966	1014.6668
X_155	39 45 34.73969	-100 30 57.57570	819.7213
Z151	39 14 04.92266	-100 27 41.13636	816.1859
Z77	39 44 48.08598	-101 02 16.37831	923.5657

OUTPUT VARIANCE/COVARIANCE

2

STA_ID	SE/SN/SUP	CX matrix (m)-----		
	(95.00 %)	(not scaled by confidence level)		
	(m)	(ECEF, XYZ cartesian)		
A20	0.0304	1.8178e-004		
	0.0375	1.0800e-004	5.6128e-004	
	0.0693	-3.7098e-005	-2.7281e-004	4.4843e-004
ATL01	0.0269	1.3577e-004		



```

0.0331 6.8743e-005 4.2577e-004
0.0605 -2.6069e-005 -2.0899e-004 3.5345e-004

ATL02    0.0289 1.5576e-004
0.0361 7.7246e-005 4.9681e-004
0.0655 -2.3062e-005 -2.4482e-004 4.2083e-004

ATL03    0.0331 2.2079e-004
0.0407 1.4680e-004 7.1410e-004
0.0773 -4.7367e-005 -3.4082e-004 5.2275e-004

DUSTY    0.0246 1.1064e-004
0.0288 4.7303e-005 3.2403e-004
0.0525 -1.4499e-005 -1.5697e-004 2.6450e-004

F82      0.0273 1.4111e-004
0.0323 7.0248e-005 4.1426e-004
0.0593 -2.2461e-005 -2.0002e-004 3.3022e-004

HLC_C    0.0270 1.3147e-004
0.0303 4.7580e-005 3.4565e-004
0.0558 -3.3818e-005 -1.8059e-004 3.1776e-004

M98      0.0317 1.9530e-004
0.0395 1.1736e-004 6.5651e-004
0.0746 -3.4570e-005 -3.2105e-004 5.0462e-004

NEMC     0.0122 2.5000e-005
0.0122 -2.3275e-022 2.5000e-005
0.0122 3.7058e-022 -1.4664e-021 2.5000e-005

SYFA     0.0271 1.3010e-004
0.0312 4.7848e-005 4.1585e-004
0.0573 -3.8955e-006 -1.8631e-004 2.8695e-004

X_155    0.0237 1.0536e-004
0.0285 5.1798e-005 3.1524e-004
0.0526 -1.9324e-005 -1.6013e-004 2.7042e-004

Z151     0.0246 1.1073e-004
0.0288 4.6792e-005 3.2410e-004
0.0545 -2.1654e-005 -1.7798e-004 2.9975e-004

Z77      0.0233 1.0148e-004
0.0274 4.7942e-005 2.9084e-004
0.0508 -1.4732e-005 -1.5020e-004 2.5362e-004

```

VARIANCE FACTOR = 1.0000

Note: Values < 1.0 indicate statistics are pessimistic, while
values > 1.0 indicate optimistic statistics. Entering this
value as the network adjustment scale factor will bring
variance factor to one.

1.3 Primary Control Network Survey Constrained Adjustment Report

* NETWORK - WEIGHTED GNSS NETWORK ADJUSTMENT *



* *
* (c) Copyright NovAtel Inc., (2015) *
* *
* Version: 8.60.4331 *
* *
* *

FILE:

V:\2015\15164_2016_Kansas_LiDAR\400_Working\402_Survey\06_Control_Network\15164_North_Network_2\15164_North_Network.net

DATE(m/d/y): Tue. 2/16/16 TIME: 13:26:19

f

DATUM: 'NAD83(2011)'
SCALE_FACTOR: 3.4532
CONFIDENCE LEVEL: 95.00 % (Scale factor is 2.4479)

INPUT CONTROL/CHECK POINTS

STA_ID	TYPE	-- LATITUDE --	-- LONGITUDE --	ELLHGT	HZ-SD	V-SD
A20	GCP-VT		1077.535	0.00500		
DUSTY	GCP-HZ	39 19 21.17845	-101 08 26.00988		0.00500	
F82	GCP-VT		1099.497	0.00500		
HLC_C	CHK-3D	39 22 26.08414	-99 49 59.82524	641.698		
M98	GCP-VT		983.743	0.00500		
NEMC	GCP-3D	40 11 57.84817	-100 34 41.39506	740.679	0.00500	0.00500
SYFA	GCP-3D	39 45 42.72606	-101 47 46.83972	1014.678	0.00500	0.00500
X_155	GCP-VT		819.754	0.00500		
Z151	GCP-VT		816.186	0.00500		
Z77	GCP-VT		923.585	0.00500		

INPUT VECTORS

SESSION NAME VECTOR(m) ----- Covariance (m) [unscaled] -----
DX/DY/DZ standard deviations in brackets

ATL01 to A20 (1) -52152.2132 1.0229e-004 (0.0101)
13527.2966 8.2661e-005 3.5523e-004 (0.0188)
3868.1644 -2.9051e-005 -1.5311e-004 2.0687e-004 (0.0144)

ATL01 to A20 (2) -52152.1917 1.7192e-004 (0.0131)
13527.3293 1.5304e-004 4.3910e-004 (0.0210)

3868.1352 -1.7391e-004 -3.3005e-004 1.4842e-003 (0.0385)

ATL01 to ATL02 (1) 54175.3894 1.1636e-004 (0.0108)
-7886.2994 8.7206e-005 2.4367e-004 (0.0156)
2807.1145 -3.7985e-006 -1.1363e-004 2.5386e-004 (0.0159)

ATL01 to ATL02 (2) 54175.3502 8.9154e-005 (0.0094)
-7886.3050 1.1875e-005 3.7417e-004 (0.0193)
2807.1287 2.5719e-005 -2.2857e-004 3.2380e-004 (0.0180)

ATL01 to ATL03 (1) -57985.7455 2.0468e-004 (0.0143)
-14207.3684 2.6955e-004 7.4970e-004 (0.0274)
-31567.6178 -1.1052e-004 -3.4007e-004 3.5343e-004 (0.0188)

ATL01 to F82 (1) -41471.2797 1.2432e-004 (0.0111)
45647.0034 8.8132e-005 5.9281e-004 (0.0243)
45272.6504 -4.5839e-005 -3.9377e-004 4.7194e-004 (0.0217)

ATL01 to M98 (1) -24678.3492 9.8329e-005 (0.0099)
-18519.0173 7.1347e-005 3.5514e-004 (0.0188)
-28631.0205 -2.5600e-005 -1.7710e-004 3.2250e-004 (0.0180)

ATL01 to Z151 (1) 62480.1743 8.7582e-005 (0.0094)
17947.5243 6.6678e-005 3.1547e-004 (0.0178)
36024.7853 -2.0624e-005 -1.1754e-004 2.3330e-004 (0.0153)

ATL02 to Z151 (1) 8304.8233 1.0463e-004 (0.0102)
25833.8449 1.3000e-004 5.2635e-004 (0.0229)
33217.6442 -4.5927e-005 -1.8168e-004 2.2639e-004 (0.0150)

ATL02 to HLC_C (1) 63391.7575 1.9324e-004 (0.0139)
26058.2058 -6.2776e-005 2.7777e-004 (0.0167)
45067.7028 2.3254e-005 -9.9377e-005 9.0165e-005 (0.0095)

ATL02 to M98 (1) -78853.6818 1.4087e-004 (0.0119)
-10632.7384 5.0796e-005 7.4646e-004 (0.0273)
-31438.1015 4.1262e-005 -5.1844e-004 6.6575e-004 (0.0258)

ATL03 to A20 (1) 5833.5547 1.6868e-004 (0.0130)
27734.6926 1.2148e-004 5.2618e-004 (0.0229)
35435.7355 -7.5894e-006 -1.8986e-004 2.2562e-004 (0.0150)

ATL03 to M98 (1) 33307.4359 1.1168e-004 (0.0106)
-4311.6502 7.8608e-005 2.7936e-004 (0.0167)
2936.5712 -9.4731e-006 -1.0764e-004 1.8607e-004 (0.0136)

ATL03 to M98 (2) 33307.4088 9.9158e-005 (0.0100)
-4311.6340 8.6510e-005 3.5923e-004 (0.0190)
2936.5988 -4.2963e-005 -2.4429e-004 3.9329e-004 (0.0198)

DUSTY to ATL01 (1) -6044.7707 7.3542e-005 (0.0086)
-34871.7721 6.6734e-005 3.3739e-004 (0.0184)
-43679.1446 -2.8382e-005 -1.3272e-004 2.3528e-004 (0.0153)

DUSTY to F82 (1) -47516.0673 8.6785e-005 (0.0093)
10775.2002 3.9388e-005 3.3151e-004 (0.0182)
1593.5201 -1.3208e-005 -1.4618e-004 2.3003e-004 (0.0152)

DUSTY to X_155 (1) 58568.2952 1.1334e-004 (0.0106)
20382.7468 5.5781e-005 3.7282e-004 (0.0193)
37327.5166 -7.7144e-006 -1.5020e-004 2.2845e-004 (0.0151)

DUSTY to Z151 (1) 56435.4030 1.2215e-004 (0.0111)
-16924.2185 1.0602e-004 3.7126e-004 (0.0193)
-7654.3838 -5.8322e-005 -2.1313e-004 3.0241e-004 (0.0174)

DUSTY to Z151 (2) 56435.4201 7.2480e-005 (0.0085)
-16924.2720 2.5970e-005 2.9595e-004 (0.0172)
-7654.3397 -4.0127e-006 -1.2001e-004 1.8073e-004 (0.0134)

DUSTY to Z77 (1) 14438.0685 1.0132e-004 (0.0101)
27764.5595 6.7832e-005 3.1987e-004 (0.0179)
36287.5693 -7.5032e-006 -1.2690e-004 2.0498e-004 (0.0143)

DUSTY to Z77 (2) 14438.0757 1.0275e-004 (0.0101)
27764.5815 7.5249e-005 3.1837e-004 (0.0178)
36287.5560 -1.8610e-005 -1.4060e-004 2.2810e-004 (0.0151)

F82 to A20 (1) -10680.9394 1.1935e-004 (0.0109)
-32119.7660 9.6778e-005 3.6307e-004 (0.0191)
-41404.4621 -3.2313e-005 -1.9517e-004 2.9001e-004 (0.0170)

F82 to Z77 (1) 61954.1027 2.1932e-004 (0.0148)
16989.3063 2.3014e-004 4.7642e-004 (0.0218)
34694.0859 -1.3486e-004 -2.8573e-004 3.9639e-004 (0.0199)

HLC_C to Z151 (1) -55087.0342 8.3732e-005 (0.0092)
-224.2472 -3.6383e-005 1.0878e-004 (0.0104)
-11850.1235 8.3333e-006 -2.7639e-005 3.2000e-005 (0.0057)

M98 to A20 (1) -27473.8445 2.3778e-004 (0.0154)
32046.3226 3.2073e-004 1.2395e-003 (0.0352)
32499.1555 -5.8388e-005 -3.9522e-004 2.9295e-004 (0.0171)

NEMC to HLC_C (1) 52421.4404 1.0873e-004 (0.0104)
-68960.6772 9.5819e-005 4.0302e-004 (0.0201)
-70500.7975 -9.1923e-005 -3.1160e-004 5.6705e-004 (0.0238)

NEMC to X_155 (1) -532.7081 8.6452e-005 (0.0093)
-31877.7535 6.8561e-005 3.3232e-004 (0.0182)
-37369.0077 -2.9920e-005 -1.8714e-004 2.9037e-004 (0.0170)

NEMC to Z77 (1) -44662.9130 1.0788e-004 (0.0104)
-24495.9096 8.4095e-005 3.8046e-004 (0.0195)
-38408.9823 -2.4173e-005 -2.3948e-004 3.7433e-004 (0.0193)



SYFA to F82 (1) 1568.8950 1.0209e-004 (0.0101)
-30845.6626 1.2728e-005 4.2224e-004 (0.0205)
-36048.0644 7.9701e-006 -1.5537e-004 2.1423e-004 (0.0146)

SYFA to DUSTY (1) 49084.9485 1.7104e-004 (0.0131)
-41620.8689 -9.1502e-005 8.7193e-004 (0.0295)
-37641.5829 2.3807e-005 -2.8159e-004 2.8640e-004 (0.0169)

SYFA to NEMC (1) 108185.9322 1.3799e-004 (0.0117)
10639.5658 8.4596e-005 5.8297e-004 (0.0241)
37054.9776 -1.9885e-006 -2.0172e-004 2.3918e-004 (0.0155)

SYFA to Z77 (1) 63523.0129 1.0717e-004 (0.0104)
-13856.3526 1.0378e-004 3.4352e-004 (0.0185)
-1353.9893 -2.6985e-005 -1.6997e-004 2.9334e-004 (0.0171)

X_155 to Z151 (1) -2132.8674 9.6725e-005 (0.0098)
-37306.9470 6.7462e-005 4.2290e-004 (0.0206)
-44981.9172 -3.3476e-005 -3.1659e-004 4.4857e-004 (0.0212)

X_155 to Z77 (1) -44130.2016 1.0721e-004 (0.0104)
7381.8453 5.2456e-005 3.4199e-004 (0.0185)
-1039.9639 -1.2275e-005 -1.4303e-004 2.1830e-004 (0.0148)

Z151 to Z77 (1) -41997.3194 1.2679e-004 (0.0113)
44688.8066 1.3070e-004 8.2655e-004 (0.0287)
43941.9365 -1.3138e-004 -8.3670e-004 1.1638e-003 (0.0341)

OUTPUT VECTOR RESIDUALS (East, North, Height - Local Level)

SESSION NAME	-- RE --	-- RN --	-- RH --	- PPM -	DIST	STD	-
(m)	(m)	(m)	(km)	(m)			
ATL01 to A20 (1)	0.0082	-0.0060	-0.0128	0.303	54.0	0.0479	
ATL01 to A20 (2)	-0.0064	-0.0060	0.0338	0.646	54.0	0.0851	
ATL01 to ATL02 (1)	-0.0199	-0.0039	0.0402	0.821	54.8	0.0460	
ATL01 to ATL02 (2)	0.0175	-0.0069	0.0213	0.518	54.8	0.0521	
ATL01 to ATL03 (1)	-0.0104	0.0069	0.0345	0.544	67.5	0.0672	
ATL01 to F82 (1)	-0.0045	0.0090	-0.0404	0.545	76.5	0.0641	
ATL01 to M98 (1)	0.0100	0.0044	0.0170	0.481	42.1	0.0518	
ATL01 to Z151 (1)	0.0002	-0.0039	-0.0316	0.428	74.3	0.0469	
ATL02 to Z151 (1)	-0.0135	0.0031	-0.0333	0.841	42.9	0.0544	
ATL02 to HLC_C (1)	0.1065	-0.0227	0.0936	1.750	82.0	0.0440	
ATL02 to M98 (1)	-0.0298	-0.0122	-0.0514	0.709	85.6	0.0732	
ATL03 to A20 (1)	0.0022	0.0039	0.0064	0.173	45.4	0.0564	
ATL03 to M98 (1)	-0.0186	0.0139	0.0039	0.697	33.7	0.0446	
ATL03 to M98 (2)	0.0112	-0.0142	-0.0051	0.559	33.7	0.0542	
DUSTY to ATL01 (1)	0.0038	-0.0089	0.0294	0.550	56.2	0.0472	
DUSTY to F82 (1)	0.0098	0.0106	-0.0463	0.995	48.7	0.0473	



DUSTY to X_155 (1)	-0.0108	-0.0016	0.0343	0.497	72.4	0.0497
DUSTY to Z151 (1)	0.0099	-0.0120	0.0354	0.651	59.4	0.0524
DUSTY to Z151 (2)	-0.0170	-0.0149	-0.0307	0.641	59.4	0.0435
DUSTY to Z77 (1)	0.0027	0.0069	-0.0093	0.248	47.9	0.0465
DUSTY to Z77 (2)	-0.0001	0.0025	0.0169	0.357	47.9	0.0473
F82 to A20 (1)	0.0066	0.0038	-0.0335	0.642	53.5	0.0516
F82 to Z77 (1)	0.0148	0.0051	-0.0315	0.482	73.0	0.0614
HLC_C to Z151 (1)	-0.0012	0.0168	-0.0128	0.376	56.3	0.0278
M98 to A20 (1)	-0.0192	0.0047	-0.0017	0.373	53.3	0.0782
NEMC to HLC_C (1)	-0.0191	0.0925	-0.0717	1.061	111.7	0.0610
NEMC to X_155 (1)	0.0022	-0.0188	0.0607	1.294	49.1	0.0495
NEMC to Z77 (1)	0.0005	-0.0113	0.0613	0.978	63.8	0.0546
SYFA to F82 (1)	0.0032	-0.0163	0.0088	0.396	47.5	0.0505
SYFA to DUSTY (1)	0.0056	-0.0227	0.0474	0.709	74.6	0.0678
SYFA to NEMC (1)	-0.0017	0.0098	-0.0546	0.483	114.8	0.0576
SYFA to Z77 (1)	0.0037	-0.0070	-0.0107	0.205	65.0	0.0507
X_155 to Z151 (1)	-0.0004	-0.0119	0.0292	0.540	58.5	0.0578
X_155 to Z77 (1)	-0.0049	-0.0020	-0.0047	0.158	44.8	0.0480
Z151 to Z77 (1)	-0.0165	0.0122	-0.0103	0.304	75.4	0.0855

RMS 0.0213 0.0190 0.0371

\$ - This session is flagged as a 3-sigma outlier

CHECK POINT RESIDUALS (East, North, Height - Local Level)

STA. NAME	-- RE --	-- RN --	-- RH --
	(m)	(m)	(m)
HLC_C	0.1462	-0.0690	0.0570

RMS	0.1462	0.0690	0.0570

CONTROL POINT RESIDUALS (ADJUSTMENT MADE)

STA. NAME	-- RE --	-- RN --	-- RH --
	(m)	(m)	(m)
A20		0.0001	
DUSTY	0.0011	-0.0007	
F82		0.0005	
M98		-0.0001	
NEMC	-0.0015	0.0026	0.0008
SYFA	0.0004	-0.0019	-0.0004
X_155		-0.0012	
Z151		0.0008	
Z77		-0.0004	



RMS 0.0011 0.0019 0.0006

OUTPUT STATION COORDINATES (LAT/LONG/HT)

STA_ID	--	LATITUDE	--	LONGITUDE	--	ELLHGT
A20		38 51 35.56380		-101 45 02.92660		1077.5352
ATL01		38 48 58.62626		-101 07 52.56622		921.2489
ATL02		38 50 58.74128		-100 30 05.26936		795.9789
ATL03		38 27 04.29175		-101 45 05.52328		1075.3613
DUSTY		39 19 21.17843		-101 08 26.00984		980.0066
F82		39 20 24.79515		-101 42 19.44034		1099.4974
HLC_C		39 22 26.08190		-99 49 59.81913		641.7550
M98		38 29 08.26964		-101 22 04.01056		983.7429
NEMC		40 11 57.84825		-100 34 41.39512		740.6798
SYFA		39 45 42.72600		-101 47 46.83970		1014.6776
X_155		39 45 34.74009		-100 30 57.57571		819.7528
Z151		39 14 04.92314		-100 27 41.13628		816.1867
Z77		39 44 48.08648		-101 02 16.37833		923.5847

OUTPUT VARIANCE/COVARIANCE

2

STA_ID	SE/SN/SUP	-----	CX matrix (m)-----
			(95.00 %) (not scaled by confidence level)
			(m) (ECEF, XYZ cartesian)
A20	0.0299	1.5660e-004	
	0.0383	1.2790e-005	1.0540e-004
	0.0120	4.6975e-005	1.0084e-004 1.5588e-004
ATL01	0.0231	9.8152e-005	
	0.0300	3.4458e-005	2.0465e-004
	0.0380	-1.0475e-006	-4.2884e-005 1.7756e-004
ATL02	0.0276	1.3794e-004	
	0.0322	4.6184e-005	3.1688e-004
	0.0472	4.2909e-007	-9.1649e-005 2.1786e-004
ATL03	0.0349	2.3827e-004	
	0.0438	1.0863e-004	4.3887e-004
	0.0541	9.6370e-006	-7.3467e-005 3.3517e-004
DUSTY	0.0110	2.3898e-005	
	0.0113	2.0389e-005	1.2791e-004
	0.0347	-1.5850e-005	-8.6285e-005 9.1012e-005



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FILE:

V:\2015\15164_2016_Kansas_LiDAR\400_Working\402_Survey\06_Control_Network\15164_North_Network_2\15164_North_Network.net

DATE(m/d/y): Tue. 3/01/16 TIME: 12:52:40

DATUM: 'NAD83(2011)'
GRID: UTM, Zone 14
SCALE_FACTOR: 1.0000
CONFIDENCE LEVEL: 95.00 % (Scale factor is 2.4479)

INPUT CONTROL/CHECK POINTS

STA_ID	TYPE	--	LATITUDE	--	LONGITUDE	--	ELLHGT	-	HZ-SD	V-SD
A20	GCP-3D	38 51	35.56380	-101 45	02.92660	1077.535	0.00500	0.00500		
ATL01	GCP-3D	38 48	58.62626	-101 07	52.56622	921.249	0.00500	0.00500		
ATL02	GCP-3D	38 50	58.74128	-100 30	05.26936	795.979	0.00500	0.00500		
ATL03	GCP-3D	38 27	04.29175	-101 45	05.52328	1075.361	0.00500	0.00500		
DUSTY	GCP-3D	39 19	21.17843	-101 08	26.00984	980.007	0.00500	0.00500		
F82	GCP-3D	39 20	24.79515	-101 42	19.44034	1099.497	0.00500	0.00500		
HLC_C	GCP-3D	39 22	26.08190	-99 49	59.81913	641.755	0.00500	0.00500		
M98	GCP-3D	38 29	08.26964	-101 22	04.01056	983.743	0.00500	0.00500		
NEMC	GCP-3D	40 11	57.84817	-100 34	41.39506	740.679	0.00500	0.00500		
SYFA	GCP-3D	39 45	42.72600	-101 47	46.83970	1014.677	0.00500	0.00500		
X_155	GCP-3D	39 45	34.74009	-100 30	57.57571	819.753	0.00500	0.00500		
Z151	GCP-3D	39 14	04.92314	-100 27	41.13628	816.187	0.00500	0.00500		
Z77	GCP-3D	39 44	48.08648	-101 02	16.37833	923.585	0.00500	0.00500		

INPUT VECTORS

SESSION NAME	VECTOR(m)	-----	Covariance (m) [unscaled]	-----
	DX/DY/DZ		standard deviations in brackets	
A20 to GCP104 (1)	-18559.4507	2.0606e-004	(0.0144)	
	26956.5202	2.7806e-004	9.1669e-004	(0.0303)
	28009.2751	-1.3818e-004	-5.6349e-004	5.2453e-004 (0.0229)
A20 to GCP120 (1)	-24165.0735	1.0271e-004	(0.0101)	
	20429.7836	8.6955e-005	4.4070e-004	(0.0210)

18759.9960 -1.1297e-004 -5.5839e-004 1.1196e-003 (0.0335)

A20 to GCP40 (1) 8862.0723 7.1727e-005 (0.0085)
6405.1611 6.1580e-005 2.5814e-004 (0.0161)
9917.5318 -2.8753e-005 -8.3143e-005 1.3759e-004 (0.0117)

A20 to GCP41 (1) -5368.4571 7.4953e-005 (0.0087)
16404.6421 5.5734e-005 1.9745e-004 (0.0141)
18562.5130 -2.4700e-005 -1.1593e-004 3.5875e-004 (0.0189)

A20 to GCP42 (1) -23773.1678 5.0284e-005 (0.0071)
7863.1020 3.5672e-005 2.0044e-004 (0.0142)
3579.5944 -2.2553e-005 -9.2980e-005 1.9943e-004 (0.0141)

A20 to GCP43 (1) -10835.4397 7.9586e-005 (0.0089)
-4112.3716 5.6687e-005 3.3275e-004 (0.0182)
-7673.6728 -1.4618e-005 -1.1371e-004 1.2648e-004 (0.0112)

A20 to GCP50 (1) -25620.0539 1.0690e-004 (0.0103)
-11341.9980 7.0440e-005 2.3336e-004 (0.0153)
-20279.4233 1.7970e-005 -8.0729e-005 1.8472e-004 (0.0136)

A20 to GCP58 (1) -15873.0268 6.6513e-005 (0.0082)
20656.9351 4.9476e-005 2.2317e-004 (0.0149)
21103.5067 -2.1864e-005 -1.0124e-004 1.5579e-004 (0.0125)

A20 to GCP68 (1) 3058.2045 1.2080e-004 (0.0110)
9516.3227 8.4644e-005 2.3676e-004 (0.0154)
12318.5363 1.2609e-005 -7.7989e-005 1.6803e-004 (0.0130)

A20 to GCP69 (1) -21595.3354 7.2928e-005 (0.0085)
206.8197 6.6625e-005 2.8514e-004 (0.0169)
-15159.8812 -3.3337e-005 -9.6655e-005 1.5722e-004 (0.0125)

A20 to GCP70 (1) -22228.7116 7.4763e-005 (0.0086)
-18716.9910 5.5319e-005 1.8742e-004 (0.0137)
-28466.5514 -2.9856e-005 -1.1446e-004 3.8118e-004 (0.0195)

A20 to GCP71 (1) -1464.8600 1.1214e-004 (0.0106)
-10114.8048 8.1229e-005 3.5333e-004 (0.0188)
-12688.6508 -5.7623e-005 -1.8710e-004 2.7849e-004 (0.0167)

A20 to GCP72 (1) 18225.6455 1.2481e-004 (0.0112)
432.8973 1.4811e-004 3.8300e-004 (0.0196)
4908.3627 -1.2451e-004 -2.5835e-004 3.8583e-004 (0.0196)

A20 to GCP84 (1) 15462.5728 1.1514e-004 (0.0107)
-19137.0970 1.6177e-004 5.4672e-004 (0.0234)
-19545.1045 -6.1027e-005 -2.4193e-004 1.9725e-004 (0.0140)

ATL01 to A20 (1) -52152.2132 1.0229e-004 (0.0101)
13527.2966 8.2661e-005 3.5523e-004 (0.0188)
3868.1644 -2.9051e-005 -1.5311e-004 2.0687e-004 (0.0144)

ATL01 to A20 (2) -52152.1917 1.7192e-004 (0.0131)
13527.3293 1.5304e-004 4.3910e-004 (0.0210)
3868.1352 -1.7391e-004 -3.3005e-004 1.4842e-003 (0.0385)

ATL01 to GCP34 (1) -3914.3447 9.8357e-005 (0.0099)
20044.2168 6.4151e-005 2.3303e-004 (0.0153)
23462.2171 1.8865e-005 -8.3401e-005 1.8831e-004 (0.0137)

ATL01 to GCP35 (1) 11872.8595 1.3867e-004 (0.0118)
9453.7127 1.8857e-004 5.6973e-004 (0.0239)
14354.4387 -7.9327e-005 -2.6642e-004 2.1537e-004 (0.0147)

ATL01 to GCP36 (1) 25461.9680 1.0340e-004 (0.0102)
172.2484 9.9991e-005 7.3663e-004 (0.0271)
6156.8019 -1.0849e-004 -8.2691e-004 1.2813e-003 (0.0358)

ATL01 to GCP38 (1) -8257.6526 7.3847e-005 (0.0086)
-343.2183 5.3191e-005 2.0889e-004 (0.0145)
-2422.3568 -1.8452e-005 -1.1236e-004 3.2410e-004 (0.0180)

ATL01 to GCP82 (1) 3686.3307 8.3712e-005 (0.0091)
12580.3026 7.7707e-005 3.3521e-004 (0.0183)
16213.5039 -3.7099e-005 -1.7998e-004 2.0366e-004 (0.0143)

ATL01 to GCP89 (1) 3697.0504 6.0749e-005 (0.0078)
-5831.5535 4.0997e-005 1.8526e-004 (0.0136)
-6283.7135 -1.7231e-005 -8.0010e-005 1.4327e-004 (0.0120)

ATL01 to GCP99 (1) 15354.7176 1.1656e-004 (0.0108)
-5100.8946 1.6271e-004 5.0687e-004 (0.0225)
-2696.3689 -6.4795e-005 -2.2985e-004 1.9256e-004 (0.0139)

ATL02 to ATL01 (2) -54175.3498 8.9235e-005 (0.0094)
7886.3052 1.1457e-005 3.7433e-004 (0.0193)
-2807.1289 2.6283e-005 -2.2852e-004 3.2397e-004 (0.0180)

ATL02 to ATL01 (1) -54175.3709 1.3081e-004 (0.0114)
7886.3428 1.1418e-004 3.7370e-004 (0.0193)
-2807.1696 -2.8430e-005 -1.3366e-004 2.2519e-004 (0.0150)

ATL03 to ATL01 (1) 57985.7427 2.0265e-004 (0.0142)
14207.3521 2.6183e-004 7.3441e-004 (0.0271)
31567.6255 -1.1035e-004 -3.3849e-004 3.4506e-004 (0.0186)

ATL03 to A20 (1) 5833.5547 1.6868e-004 (0.0130)
27734.6926 1.2148e-004 5.2618e-004 (0.0229)
35435.7355 -7.5894e-006 -1.8986e-004 2.2562e-004 (0.0150)

ATL03 to GCP116 (1) -4433.7982 6.2995e-005 (0.0079)
-12593.7689 4.7565e-005 1.8426e-004 (0.0136)
-16727.3062 -1.1779e-005 -8.7345e-005 2.2693e-004 (0.0151)

ATL03 to GCP117 (1) 9603.0387 1.0660e-004 (0.0103)
-20218.0409 7.9917e-005 2.0997e-004 (0.0145)
-22664.7240 1.6722e-005 -7.2741e-005 1.7585e-004 (0.0133)

ATL03 to GCP48 (1) 8734.4560 8.7810e-005 (0.0094)
-5354.1608 8.0726e-005 2.9592e-004 (0.0172)
-4416.9448 -2.6120e-005 -7.1535e-005 1.1853e-004 (0.0109)

ATL03 to GCP49 (1) -9032.0465 9.2108e-005 (0.0096)
4909.9097 8.0165e-005 3.5747e-004 (0.0189)
3775.7325 -3.6539e-005 -1.2499e-004 1.3806e-004 (0.0117)

ATL03 to GCP51 (1) -23719.3068 1.0231e-004 (0.0101)
-3226.5006 9.3314e-005 6.7112e-004 (0.0259)
-10043.9879 -8.9827e-005 -6.5822e-004 8.3356e-004 (0.0289)

ATL03 to GCP85 (1) -269.4688 1.9144e-005 (0.0044)
-972.4572 1.7212e-005 6.4238e-005 (0.0080)
-1265.2342 -1.7591e-005 -4.8473e-005 9.1563e-005 (0.0096)

ATL03 to GCP86 (1) -17845.2695 8.5449e-005 (0.0092)
-6524.0032 7.7765e-005 2.8077e-004 (0.0168)
-12620.4623 -1.7467e-005 -1.0479e-004 1.2407e-004 (0.0111)

DUSTY to ATL01 (2) -6044.7528 1.4325e-004 (0.0120)
-34871.7037 1.0960e-004 1.1570e-003 (0.0340)
-43679.1763 -6.7349e-005 -8.3620e-004 9.5462e-004 (0.0309)

DUSTY to ATL01 (1) -6044.7707 7.3542e-005 (0.0086)
-34871.7721 6.6734e-005 3.3739e-004 (0.0184)
-43679.1446 -2.8382e-005 -1.3272e-004 2.3528e-004 (0.0153)

DUSTY to GCP06 (1) 27236.5305 1.2396e-004 (0.0111)
3437.5952 1.0582e-004 5.4171e-004 (0.0233)
10306.7717 -3.5376e-005 -3.1783e-004 3.1936e-004 (0.0179)

DUSTY to GCP25 (1) 23927.3208 7.1905e-005 (0.0085)
-16060.7293 5.0930e-005 1.7796e-004 (0.0133)
-13852.4537 -2.4332e-005 -1.0273e-004 3.5638e-004 (0.0189)

DUSTY to GCP26 (1) 95.2670 2.0561e-005 (0.0045)
-4184.6580 1.8239e-005 6.5635e-005 (0.0081)
-5021.2762 -1.9412e-005 -4.9967e-005 9.7228e-005 (0.0099)

DUSTY to GCP27 (1) -6359.3676 9.4160e-005 (0.0097)
4432.8679 1.0286e-004 5.1779e-004 (0.0228)
3812.1993 -9.4843e-005 -2.7685e-004 3.0740e-004 (0.0175)

DUSTY to GCP39 (1) -29914.7736 6.0089e-005 (0.0078)
-23904.1439 4.0109e-005 2.5378e-004 (0.0159)
-36114.6101 -2.0870e-005 -1.0368e-004 2.1705e-004 (0.0147)

DUSTY to GCP73 (1) -18879.3711 7.6504e-005 (0.0087)

-10637.6316 3.0675e-005 1.9210e-004 (0.0139)
-17254.3463 6.2488e-006 -1.3701e-004 4.1025e-004 (0.0203)

DUSTY to GCP74 (1) -5403.2151 1.7392e-005 (0.0042)
1102.5146 1.2567e-005 7.9878e-005 (0.0089)
57.7277 -4.4296e-006 -2.4534e-005 5.2737e-005 (0.0073)

DUSTY to GCP75 (1) 20539.7109 9.5844e-005 (0.0098)
8491.9191 5.6030e-005 3.1309e-004 (0.0177)
14828.0068 -7.8633e-005 -2.8393e-004 5.7065e-004 (0.0239)

DUSTY to GCP80 (1) 36604.6642 1.2728e-004 (0.0113)
-1349.8847 1.7517e-004 5.3077e-004 (0.0230)
6692.3540 -6.7989e-005 -2.3537e-004 2.0172e-004 (0.0142)

DUSTY to GCP81 (1) 7160.3180 1.3884e-004 (0.0118)
-9766.4437 8.7622e-005 2.6561e-004 (0.0163)
-10088.2531 -3.2315e-007 -9.3867e-005 1.6997e-004 (0.0130)

F82 to ATL01 (1) 41471.2753 1.2281e-004 (0.0111)
-45647.0103 9.5781e-005 4.5343e-004 (0.0213)
-45272.6272 -3.9683e-005 -2.2566e-004 2.7683e-004 (0.0166)

F82 to A20 (1) -10680.9394 1.1935e-004 (0.0109)
-32119.7660 9.6778e-005 3.6307e-004 (0.0191)
-41404.4621 -3.2313e-005 -1.9517e-004 2.9001e-004 (0.0170)

F82 to DUSTY (1) 47516.0759 8.8180e-005 (0.0094)
-10775.2059 7.1008e-005 2.7954e-004 (0.0167)
-1593.5210 -2.2588e-005 -1.3703e-004 2.3987e-004 (0.0155)

F82 to GCP105 (1) -26782.6349 6.3864e-005 (0.0080)
13552.2081 5.6253e-005 2.1799e-004 (0.0148)
9534.2985 -5.8378e-005 -1.5918e-004 3.0805e-004 (0.0176)

F82 to GCP28 (1) 24127.1103 6.3299e-005 (0.0080)
4300.8964 4.4290e-005 1.8667e-004 (0.0137)
10912.7887 -1.8087e-005 -8.0764e-005 1.5780e-004 (0.0126)

F82 to GCP29 (1) 4072.3354 9.6931e-005 (0.0098)
12497.4437 8.8608e-005 9.0220e-004 (0.0300)
15832.3872 -1.0906e-004 -1.1091e-003 1.7404e-003 (0.0417)

F82 to GCP31 (1) -14350.6082 5.8251e-005 (0.0076)
2689.3241 2.4369e-005 2.3034e-004 (0.0152)
-317.4805 -1.3117e-005 -6.6449e-005 1.4187e-004 (0.0119)

F82 to GCP32 (1) 3206.1852 5.5437e-005 (0.0074)
-7140.1682 4.3910e-005 1.9547e-004 (0.0140)
-7771.9002 -3.4274e-005 -1.0795e-004 2.1946e-004 (0.0148)

F82 to GCP33 (1) 21095.1180 3.0524e-003 (0.0552)
-15908.0113 -1.3382e-003 3.5383e-003 (0.0595)

-14012.0754 1.1105e-004 -4.3061e-004 1.1293e-003 (0.0336)

F82 to GCP56 (1) -3789.4253 1.1018e-004 (0.0105)
17296.9724 7.7800e-005 3.5345e-004 (0.0188)
19596.0014 -6.4809e-005 -2.2030e-004 3.6771e-004 (0.0192)

F82 to GCP57 (1) -21352.7016 5.0526e-005 (0.0071)
8322.2149 3.5439e-005 1.9059e-004 (0.0138)
4657.2266 -2.0868e-005 -8.3606e-005 1.8687e-004 (0.0137)

F82 to GCP59 (1) -3691.9531 1.6794e-005 (0.0041)
-1582.0451 5.7888e-006 6.7669e-005 (0.0082)
-2791.2963 -1.1940e-006 -1.9405e-005 3.7160e-005 (0.0061)

F82 to GCP60 (1) 16802.1779 9.8209e-005 (0.0099)
6807.1823 1.1956e-004 4.0014e-004 (0.0200)
12147.3387 -4.8897e-005 -1.8748e-004 1.7804e-004 (0.0133)

F82 to GCP66 (1) 32125.7114 9.1809e-005 (0.0096)
-2468.6508 1.1971e-005 3.0922e-004 (0.0176)
4721.4894 2.3504e-005 -2.0977e-004 4.9774e-004 (0.0223)

F82 to GCP67 (1) 10478.5885 8.9622e-005 (0.0095)
-11697.3284 1.0492e-004 3.1178e-004 (0.0177)
-11478.9339 -8.1913e-005 -1.9892e-004 3.0164e-004 (0.0174)

HLC_C to ATL02 (1) -63391.7658 1.0512e-003 (0.0324)
-26058.2000 -3.1946e-004 1.5478e-003 (0.0393)
-45067.7037 1.2034e-004 -5.5736e-004 5.1432e-004 (0.0227)

M98 to ATL03 (1) -33307.4088 9.9048e-005 (0.0100)
4311.6341 8.6273e-005 3.5961e-004 (0.0190)
-2936.5989 -4.2617e-005 -2.4463e-004 3.9365e-004 (0.0198)

M98 to A20 (1) -27473.8445 2.3778e-004 (0.0154)
32046.3226 3.2073e-004 1.2395e-003 (0.0352)
32499.1555 -5.8388e-005 -3.9522e-004 2.9295e-004 (0.0171)

M98 to ATL01 (1) 24678.3486 9.8339e-005 (0.0099)
18519.0167 7.1498e-005 3.5540e-004 (0.0189)
28631.0206 -2.5754e-005 -1.7700e-004 3.2206e-004 (0.0179)

M98 to ATL02 (1) 78853.6820 1.4062e-004 (0.0119)
10632.7386 5.2638e-005 7.4846e-004 (0.0274)
31438.1015 3.9004e-005 -5.1925e-004 6.6466e-004 (0.0258)

M98 to ATL03 (2) -33307.4357 9.0862e-005 (0.0095)
4311.6486 6.3854e-005 2.5635e-004 (0.0160)
-2936.5628 -1.3011e-005 -1.0193e-004 1.7320e-004 (0.0132)

M98 to GCP113 (1) 11670.4685 8.8354e-005 (0.0094)
-18536.2145 5.1010e-005 2.2777e-004 (0.0151)
-20132.9457 -7.9357e-006 -6.2009e-005 1.0601e-004 (0.0103)

M98 to GCP114 (1) 2982.5857 1.3400e-004 (0.0116)
-17165.3353 1.0715e-004 2.2942e-004 (0.0151)
-20548.0494 5.8607e-006 -7.3300e-005 1.6496e-004 (0.0128)

M98 to GCP115 (1) 11521.9557 7.8403e-005 (0.0089)
-8085.6169 8.5373e-005 2.7066e-004 (0.0165)
-7194.0840 -7.5480e-005 -1.9538e-004 3.2231e-004 (0.0180)

M98 to GCP45 (1) -1461.6072 1.0471e-004 (0.0102)
9204.9468 6.5808e-005 3.2218e-004 (0.0179)
10988.6926 -3.9243e-005 -1.4711e-004 1.6749e-004 (0.0129)

M98 to GCP46 (1) 13985.1484 5.3613e-005 (0.0073)
-4047.1369 3.7184e-005 2.5817e-004 (0.0161)
-1600.2062 -8.8832e-006 -1.0401e-004 2.4242e-004 (0.0156)

M98 to GCP47 (1) -5720.1334 7.8965e-005 (0.0089)
-13450.6387 6.8059e-005 2.2077e-004 (0.0149)
-18060.4652 -1.6114e-005 -1.1689e-004 2.7148e-004 (0.0165)

M98 to GCP87 (1) -16415.4254 6.4915e-005 (0.0081)
-9293.1749 2.9472e-005 2.1613e-004 (0.0147)
-15544.7381 -5.4194e-006 -1.0608e-004 1.6134e-004 (0.0127)

NEMC to HLC_C (1) 52421.4404 1.0873e-004 (0.0104)
-68960.6772 9.5819e-005 4.0302e-004 (0.0201)
-70500.7975 -9.1923e-005 -3.1160e-004 5.6705e-004 (0.0238)

SYFA to GCP106 (1) -22352.6006 1.1065e-004 (0.0105)
4610.2711 7.8989e-005 4.9260e-004 (0.0222)
33.2548 -2.2748e-005 -3.0347e-004 3.3081e-004 (0.0182)

SYFA to DUSTY (1) 49084.9485 1.7104e-004 (0.0131)
-41620.8689 -9.1502e-005 8.7193e-004 (0.0295)
-37641.5829 2.3807e-005 -2.8159e-004 2.8640e-004 (0.0169)

SYFA to F82 (1) 1568.8950 1.0209e-004 (0.0101)
-30845.6626 1.2728e-005 4.2224e-004 (0.0205)
-36048.0644 7.9701e-006 -1.5537e-004 2.1423e-004 (0.0146)

SYFA to GCP01 (1) -6290.3435 1.1207e-004 (0.0106)
12796.6324 7.5937e-005 2.2759e-004 (0.0151)
13494.7791 1.9723e-005 -7.2175e-005 1.6549e-004 (0.0129)

SYFA to GCP02 (1) 10860.5356 6.0841e-005 (0.0078)
494.3705 4.1879e-005 1.6878e-004 (0.0130)
3257.9917 -1.6359e-005 -7.1191e-005 1.6102e-004 (0.0127)

SYFA to GCP02_A (1) 10072.3566 8.8176e-005 (0.0094)
669.9288 9.3348e-005 3.6757e-004 (0.0192)
3267.0826 -4.2548e-005 -1.9586e-004 2.1654e-004 (0.0147)

SYFA to GCP03 (1) 25473.5514 1.9524e-003 (0.0442)
 -8249.4325 -1.0536e-003 3.6577e-003 (0.0605)
 -3518.5060 3.9865e-004 -1.3140e-003 9.5007e-004 (0.0308)

SYFA to GCP07 (1) -16710.5664 7.6653e-005 (0.0088)
 17708.4455 7.7373e-005 2.8888e-004 (0.0170)
 16686.0915 -4.7615e-005 -1.2645e-004 2.0932e-004 (0.0145)

SYFA to GCP108 (1) 21839.7296 1.2192e-004 (0.0110)
 5665.8337 1.7383e-004 5.3597e-004 (0.0232)
 11916.0511 -6.7026e-005 -2.3637e-004 1.9581e-004 (0.0140)

SYFA to GCP18 (1) 26150.8962 7.4889e-003 (0.0865)
 11142.8513 -6.8807e-004 2.7399e-003 (0.0523)
 19248.6197 2.0031e-004 -8.7112e-004 1.0669e-003 (0.0327)

SYFA to GCP30 (1) -1411.4996 1.4890e-004 (0.0122)
 -9571.7246 1.3716e-004 4.6728e-004 (0.0216)
 -11520.1917 -1.0845e-004 -2.6225e-004 3.1619e-004 (0.0178)

SYFA to GCP52 (1) -15827.3505 9.3203e-005 (0.0097)
 -791.7550 6.3670e-005 3.2506e-004 (0.0180)
 -4764.1496 -8.8063e-005 -3.4525e-004 7.0763e-004 (0.0266)

SYFA to GCP53 (1) 2416.1559 6.2935e-005 (0.0079)
 7180.8140 4.4469e-005 1.6774e-004 (0.0130)
 9032.7307 -2.1986e-005 -8.3901e-005 2.4313e-004 (0.0156)

SYFA to GCP55 (1) 19669.8444 1.5810e-004 (0.0126)
 -4464.5272 1.2210e-004 2.7474e-004 (0.0166)
 -429.3612 6.3364e-007 -8.9988e-005 1.7078e-004 (0.0131)

SYFA to NEMC (1) 108185.9322 1.3799e-004 (0.0117)
 10639.5658 8.4596e-005 5.8297e-004 (0.0241)
 37054.9776 -1.9885e-006 -2.0172e-004 2.3918e-004 (0.0155)

X_155 to DUSTY (1) -58568.2941 1.1320e-004 (0.0106)
 -20382.7451 5.5263e-005 3.7292e-004 (0.0193)
 -37327.5167 -7.4855e-006 -1.5068e-004 2.2898e-004 (0.0151)

X_155 to NEMC (1) 532.7109 1.0745e-004 (0.0104)
 31877.7559 5.5063e-005 3.1521e-004 (0.0178)
 37369.0037 -1.6154e-005 -1.5271e-004 2.4687e-004 (0.0157)

Z151 to HLC_C (1) 55087.0320 8.3403e-005 (0.0091)
 224.2476 -3.6111e-005 1.0873e-004 (0.0104)
 11850.1241 8.3702e-006 -2.7843e-005 3.1998e-005 (0.0057)

Z151 to ATL01 (1) -62480.1599 7.3599e-005 (0.0086)
 -17947.5053 5.3155e-005 3.1443e-004 (0.0177)
 -36024.7801 -3.1147e-005 -1.3642e-004 2.6067e-004 (0.0161)

Z151 to ATL02 (1) -8304.8277 6.3186e-005 (0.0079)

-25833.8487 5.0020e-005 2.7108e-004 (0.0165)
-33217.6294 -3.3594e-006 -1.0328e-004 3.3252e-004 (0.0182)

Z151 to DUSTY (1) -56435.4139 1.3028e-004 (0.0114)
16924.2013 1.2012e-004 3.4597e-004 (0.0186)
7654.3865 -6.8096e-005 -2.2199e-004 3.3851e-004 (0.0184)

Z151 to DUSTY (2) -56435.4014 1.4201e-004 (0.0119)
16924.2372 8.9065e-005 5.5977e-004 (0.0237)
7654.3876 -5.7279e-005 -2.7379e-004 3.5730e-004 (0.0189)

Z151 to X_155 (1) 2132.8681 1.2223e-004 (0.0111)
37306.9526 1.1105e-004 3.7637e-004 (0.0194)
44981.9159 -6.3152e-005 -2.5052e-004 3.5652e-004 (0.0189)

Z77 to GCP54 (1) -25607.1671 1.1634e-004 (0.0108)
18344.5516 8.4716e-005 5.2015e-004 (0.0228)
15704.3361 -2.6063e-005 -3.1940e-004 3.4393e-004 (0.0185)

Z77 to DUSTY (1) -14438.0808 9.5660e-005 (0.0098)
-27764.5892 6.9143e-005 2.9186e-004 (0.0171)
-36287.5566 -1.4596e-005 -1.2489e-004 2.4671e-004 (0.0157)

Z77 to DUSTY (2) -14438.0875 1.2126e-004 (0.0110)
-27764.6148 1.0477e-004 4.5153e-004 (0.0212)
-36287.5700 -3.9411e-005 -1.9267e-004 3.0074e-004 (0.0173)

Z77 to DUSTY (3) -14438.0670 7.9012e-005 (0.0089)
-27764.5880 4.6534e-005 2.7376e-004 (0.0165)
-36287.5471 -1.0761e-005 -1.0062e-004 1.5067e-004 (0.0123)

Z77 to F82 (1) -61954.1182 1.8450e-004 (0.0136)
-16989.3219 1.7829e-004 4.2215e-004 (0.0205)
-34694.0680 -9.7363e-005 -2.5056e-004 3.5632e-004 (0.0189)

Z77 to GCP04 (1) -20172.3498 9.6170e-005 (0.0098)
-2429.3836 8.3293e-005 3.6369e-004 (0.0191)
-7573.4356 -3.8631e-005 -1.2784e-004 1.4469e-004 (0.0120)

Z77 to GCP05 (1) -4242.3057 9.5389e-005 (0.0098)
-14676.7266 8.1089e-005 3.6197e-004 (0.0190)
-18337.7081 -3.6090e-005 -1.2621e-004 1.4026e-004 (0.0118)

Z77 to GCP109 (1) 8561.3243 1.5033e-003 (0.0388)
10288.3250 -6.8584e-004 2.6082e-003 (0.0511)
14023.6014 2.8816e-004 -8.7458e-004 6.7753e-004 (0.0260)

Z77 to GCP15 (1) 17869.6830 7.4438e-005 (0.0086)
-5878.3250 7.2156e-005 2.7364e-004 (0.0165)
-3007.4059 -5.5526e-005 -1.6714e-004 2.7744e-004 (0.0167)

Z77 to GCP16 (1) 91.9123 7.7312e-005 (0.0088)
5905.6428 5.2949e-005 4.1850e-004 (0.0205)

6885.7979 -5.9125e-005 -1.8271e-004 2.3249e-004 (0.0152)

Z77 to GCP17 (1) -16435.9657 1.0192e-004 (0.0101)
15451.2734 1.2898e-004 4.4458e-004 (0.0211)
14430.8619 -5.2101e-005 -2.0711e-004 1.8751e-004 (0.0137)

Z77 to GCP61 (1) -29132.5993 9.6351e-005 (0.0098)
1206.5708 5.8425e-005 3.1953e-004 (0.0179)
-5275.2935 -8.1374e-005 -3.0205e-004 6.1154e-004 (0.0247)

Z77 to GCP62 (1) -7317.6348 6.2425e-005 (0.0079)
12058.8546 4.2515e-005 1.6998e-004 (0.0130)
12508.8282 -2.2148e-005 -8.1042e-005 2.2447e-004 (0.0150)

Z77 to GCP63 (1) 23876.8320 1.0440e-004 (0.0102)
7231.6946 4.0272e-005 2.1121e-004 (0.0145)
13721.6188 7.4727e-006 -8.8596e-005 1.7571e-004 (0.0133)

Z77 to GCP64 (1) 5627.6085 1.6484e-005 (0.0041)
-403.1542 1.0493e-005 7.3273e-005 (0.0086)
805.6936 -4.6101e-006 -2.8342e-005 5.7189e-005 (0.0076)

Z77 to GCP65 (1) -5210.2817 6.5532e-005 (0.0081)
-5609.7412 6.1382e-005 2.2387e-004 (0.0150)
-7802.2141 -5.3372e-005 -1.4302e-004 2.7804e-004 (0.0167)

Z77 to GCP76 (1) 6094.8461 6.1792e-005 (0.0079)
-10415.0011 4.0650e-005 2.8343e-004 (0.0168)
-10949.5029 -1.5717e-005 -8.1092e-005 1.7182e-004 (0.0131)

Z77 to GCP83 (1) -35891.8092 1.8594e-003 (0.0431)
-58013.7863 1.0921e-003 1.9456e-003 (0.0441)
-77950.5810 -3.9691e-004 -4.4854e-004 4.8633e-004 (0.0221)

Z77 to NEMC (1) 44662.9217 1.0330e-004 (0.0102)
24495.9142 8.6937e-005 3.4183e-004 (0.0185)
38408.9802 -2.5783e-005 -1.9866e-004 3.1331e-004 (0.0177)

Z77 to SYFA (1) -63523.0167 8.1626e-005 (0.0090)
13856.3443 6.3515e-005 2.6778e-004 (0.0164)
1353.9939 -1.3818e-005 -1.4691e-004 2.8400e-004 (0.0169)

Z77 to X_155 (1) 44130.2018 1.0738e-004 (0.0104)
-7381.8458 5.3533e-005 3.4244e-004 (0.0185)
1039.9654 -1.2601e-005 -1.4296e-004 2.1812e-004 (0.0148)

Z77 to Z151 (1) 41997.3330 1.0228e-004 (0.0101)
-44688.7916 6.8307e-005 3.6543e-004 (0.0191)
-43941.9516 -2.6554e-005 -1.9150e-004 2.7619e-004 (0.0166)



 OUTPUT VECTOR RESIDUALS (East, North, Height - Local Level)

SESSION NAME	-- RE --	-- RN --	-- RH --	- PPM -	DIST	STD
(m)	(m)	(m)	(km)	(m)		
A20 to GCP104 (1)	-0.0000	-0.0000	0.0000	0.000	43.1	0.0406
A20 to GCP120 (1)	-0.0000	-0.0000	-0.0000	0.000	36.8	0.0408
A20 to GCP40 (1)	0.0000	0.0000	0.0000	0.000	14.8	0.0216
A20 to GCP41 (1)	-0.0000	0.0000	0.0000	0.000	25.3	0.0251
A20 to GCP42 (1)	-0.0000	0.0000	-0.0000	0.000	25.3	0.0212
A20 to GCP43 (1)	-0.0000	-0.0000	0.0000	0.000	13.9	0.0232
A20 to GCP50 (1)	-0.0000	0.0000	-0.0000	0.000	34.6	0.0229
A20 to GCP58 (1)	-0.0000	-0.0000	-0.0000	0.000	33.5	0.0211
A20 to GCP68 (1)	-0.0000	-0.0000	0.0000	0.000	15.9	0.0229
A20 to GCP69 (1)	-0.0000	-0.0000	-0.0000	0.000	22.2	0.0227
A20 to GCP70 (1)	-0.0000	-0.0000	-0.0000	0.000	40.7	0.0254
A20 to GCP71 (1)	-0.0000	0.0000	-0.0000	0.000	16.3	0.0273
A20 to GCP72 (1)	-0.0000	-0.0000	0.0000	0.000	18.9	0.0299
A20 to GCP84 (1)	0.0000	-0.0000	0.0000	0.000	31.4	0.0293
ATL01 to A20 (1)	0.0071	-0.0081	-0.0093	0.262	54.0	0.0258
ATL01 to A20 (2)	-0.0075	-0.0081	0.0373	0.721	54.0	0.0458
ATL01 to GCP34 (1)	-0.0000	-0.0000	0.0000	0.000	31.1	0.0228
ATL01 to GCP35 (1)	-0.0000	-0.0000	0.0000	0.000	20.9	0.0304
ATL01 to GCP36 (1)	-0.0000	-0.0000	-0.0000	0.000	26.2	0.0461
ATL01 to GCP38 (1)	0.0000	-0.0000	0.0000	0.000	8.6	0.0246
ATL01 to GCP82 (1)	0.0000	0.0000	0.0000	0.000	20.9	0.0250
ATL01 to GCP89 (1)	0.0000	0.0000	-0.0000	0.000	9.3	0.0197
ATL01 to GCP99 (1)	-0.0000	-0.0000	0.0000	0.000	16.4	0.0286
ATL02 to ATL01 (2)	-0.0107	0.0052	-0.0245	0.497	54.8	0.0281
ATL02 to ATL01 (1)	0.0170	0.0162	0.0267	0.649	54.8	0.0270
ATL03 to ATL01 (1)	0.0120	-0.0011	-0.0558	0.845	67.5	0.0358
ATL03 to A20 (1)	0.0030	0.0033	0.0064	0.172	45.4	0.0303
ATL03 to GCP116 (1)	0.0000	0.0000	-0.0000	0.000	21.4	0.0218
ATL03 to GCP117 (1)	-0.0000	-0.0000	0.0000	0.000	31.9	0.0222
ATL03 to GCP48 (1)	-0.0000	0.0000	-0.0000	0.000	11.2	0.0224
ATL03 to GCP49 (1)	-0.0000	0.0000	0.0000	0.000	11.0	0.0242
ATL03 to GCP51 (1)	0.0000	0.0000	0.0000	0.000	26.0	0.0401
ATL03 to GCP85 (1)	-0.0000	-0.0000	-0.0000	0.000	1.6	0.0132
ATL03 to GCP86 (1)	-0.0000	-0.0000	0.0000	0.000	22.8	0.0221
DUSTY to ATL01 (2)	-0.0026	-0.0227	0.0945	1.729	56.2	0.0475
DUSTY to ATL01 (1)	0.0018	-0.0028	0.0197	0.356	56.2	0.0254
DUSTY to GCP06 (1)	-0.0000	0.0000	-0.0000	0.000	29.3	0.0314
DUSTY to GCP25 (1)	0.0000	0.0000	0.0000	0.000	32.0	0.0246
DUSTY to GCP26 (1)	-0.0000	0.0000	0.0000	0.000	6.5	0.0135
DUSTY to GCP27 (1)	-0.0000	-0.0000	0.0000	0.000	8.6	0.0303
DUSTY to GCP39 (1)	-0.0000	0.0000	0.0000	0.000	52.6	0.0230
DUSTY to GCP73 (1)	-0.0000	0.0000	0.0000	0.000	27.7	0.0261
DUSTY to GCP74 (1)	-0.0000	-0.0000	-0.0000	0.000	5.5	0.0122
DUSTY to GCP75 (1)	-0.0000	0.0000	-0.0000	0.000	26.7	0.0313
DUSTY to GCP80 (1)	0.0000	0.0000	0.0000	0.000	37.2	0.0293
DUSTY to GCP81 (1)	-0.0000	-0.0000	0.0000	0.000	15.8	0.0240
F82 to ATL01 (1)	0.0092	-0.0188	0.0153	0.339	76.5	0.0292



F82 to A20 (1)	0.0072	0.0052	-0.0345	0.666	53.5	0.0278
F82 to DUSTY (1)	-0.0156	-0.0101	0.0489	1.073	48.7	0.0246
F82 to GCP105 (1)	-0.0000	0.0000	-0.0000	0.000	31.5	0.0243
F82 to GCP28 (1)	0.0000	-0.0000	-0.0000	0.000	26.8	0.0202
F82 to GCP29 (1)	-0.0000	-0.0000	-0.0000	0.000	20.6	0.0523
F82 to GCP31 (1)	-0.0000	0.0000	-0.0000	0.000	14.6	0.0207
F82 to GCP32 (1)	-0.0000	0.0000	0.0000	0.000	11.0	0.0217
F82 to GCP33 (1)	0.0000	-0.0000	0.0000	0.000	29.9	0.0879
F82 to GCP56 (1)	-0.0000	0.0000	-0.0000	0.000	26.4	0.0288
F82 to GCP57 (1)	0.0000	-0.0000	-0.0000	0.000	23.4	0.0207
F82 to GCP59 (1)	-0.0000	-0.0000	-0.0000	0.000	4.9	0.0110
F82 to GCP60 (1)	0.0000	0.0000	-0.0000	0.000	21.8	0.0260
F82 to GCP66 (1)	0.0000	0.0000	-0.0000	0.000	32.6	0.0300
F82 to GCP67 (1)	-0.0000	0.0000	-0.0000	0.000	19.5	0.0265
HLC_C to ATL02 (1)	-0.1078	0.0272	-0.0930	1.767	82.0	0.0558
M98 to ATL03 (1)	-0.0116	0.0151	0.0061	0.593	33.7	0.0292
M98 to A20 (1)	-0.0188	0.0049	-0.0009	0.365	53.3	0.0421
M98 to ATL01 (1)	-0.0079	-0.0018	-0.0204	0.521	42.1	0.0279
M98 to ATL02 (1)	0.0242	0.0159	0.0525	0.700	85.6	0.0394
M98 to ATL03 (2)	0.0177	-0.0186	-0.0095	0.812	33.7	0.0228
M98 to GCP113 (1)	-0.0000	0.0000	0.0000	0.000	29.8	0.0205
M98 to GCP114 (1)	-0.0000	-0.0000	0.0000	0.000	26.9	0.0230
M98 to GCP115 (1)	-0.0000	-0.0000	0.0000	0.000	15.8	0.0259
M98 to GCP45 (1)	0.0000	-0.0000	0.0000	0.000	14.4	0.0244
M98 to GCP46 (1)	0.0000	-0.0000	-0.0000	0.000	14.6	0.0235
M98 to GCP47 (1)	0.0000	0.0000	-0.0000	0.000	23.2	0.0239
M98 to GCP87 (1)	0.0000	-0.0000	-0.0000	0.000	24.4	0.0210
NEMC to HLC_C (1)	-0.0151	0.0870	-0.0700	\$ 1.009	111.7	0.0328
SYFA to GCP106 (1)	0.0000	0.0000	0.0000	0.000	22.8	0.0306
SYFA to DUSTY (1)	0.0085	-0.0225	0.0542	0.796	74.6	0.0365
SYFA to F82 (1)	0.0023	-0.0133	0.0107	0.363	47.5	0.0272
SYFA to GCP01 (1)	-0.0000	-0.0000	-0.0000	0.000	19.6	0.0225
SYFA to GCP02 (1)	0.0000	0.0000	-0.0000	0.000	11.3	0.0198
SYFA to GCP02_A (1)	0.0000	-0.0000	-0.0000	0.000	10.6	0.0259
SYFA to GCP03 (1)	-0.0000	0.0000	-0.0000	0.000	27.0	0.0810
SYFA to GCP07 (1)	0.0000	-0.0000	-0.0000	0.000	29.5	0.0240
SYFA to GCP108 (1)	-0.0000	0.0000	-0.0000	0.000	25.5	0.0292
SYFA to GCP18 (1)	0.0000	-0.0000	0.0000	0.000	34.3	0.1063
SYFA to GCP30 (1)	0.0000	-0.0000	0.0000	0.000	15.0	0.0305
SYFA to GCP52 (1)	0.0000	-0.0000	-0.0000	0.000	16.5	0.0336
SYFA to GCP53 (1)	0.0000	-0.0000	-0.0000	0.000	11.8	0.0218
SYFA to GCP55 (1)	0.0000	0.0000	0.0000	0.000	20.2	0.0246
SYFA to NEMC (1)	-0.0012	0.0168	-0.0522	0.478	114.8	0.0310
X_155 to DUSTY (1)	0.0125	-0.0030	-0.0235	0.370	72.4	0.0267
X_155 to NEMC (1)	-0.0044	0.0232	-0.0511	1.147	49.1	0.0259
Z151 to HLC_C (1)	0.0099	-0.0160	0.0167	0.447	56.3	0.0150
Z151 to ATL01 (1)	-0.0078	-0.0075	0.0423	0.588	74.3	0.0255
Z151 to ATL02 (1)	0.0129	-0.0040	0.0214	0.591	42.9	0.0258
Z151 to DUSTY (1)	0.0025	0.0218	-0.0448	0.839	59.4	0.0285
Z151 to DUSTY (2)	-0.0031	-0.0028	-0.0163	0.284	59.4	0.0325
Z151 to X_155 (1)	0.0031	0.0128	-0.0263	0.503	58.5	0.0292
Z77 to GCP54 (1)	0.0000	-0.0000	-0.0000	0.000	35.2	0.0313
Z77 to DUSTY (1)	0.0069	-0.0003	-0.0139	0.324	47.9	0.0252



Z77 to DUSTY (2)	0.0085	0.0268	-0.0258	0.796	47.9	0.0296
Z77 to DUSTY (3)	-0.0064	-0.0101	-0.0170	0.434	47.9	0.0224
Z77 to F82 (1)	-0.0032	-0.0082	0.0101	0.183	73.0	0.0310
Z77 to GCP04 (1)	0.0000	-0.0000	0.0000	0.000	21.7	0.0246
Z77 to GCP05 (1)	-0.0000	-0.0000	0.0000	0.000	23.9	0.0244
Z77 to GCP109 (1)	0.0000	-0.0000	0.0000	0.000	19.4	0.0692
Z77 to GCP15 (1)	0.0000	0.0000	0.0000	0.000	19.1	0.0250
Z77 to GCP16 (1)	0.0000	-0.0000	0.0000	0.000	9.1	0.0270
Z77 to GCP17 (1)	0.0000	0.0000	-0.0000	0.000	26.8	0.0271
Z77 to GCP61 (1)	0.0000	-0.0000	-0.0000	0.000	29.6	0.0321
Z77 to GCP62 (1)	0.0000	0.0000	0.0000	0.000	18.9	0.0214
Z77 to GCP63 (1)	-0.0000	-0.0000	-0.0000	0.000	28.5	0.0222
Z77 to GCP64 (1)	0.0000	0.0000	0.0000	0.000	5.7	0.0121
Z77 to GCP65 (1)	0.0000	-0.0000	-0.0000	0.000	10.9	0.0238
Z77 to GCP76 (1)	0.0000	-0.0000	0.0000	0.000	16.3	0.0227
Z77 to GCP83 (1)	-0.0000	-0.0000	-0.0000	0.000	103.6	0.0655
Z77 to NEMC (1)	-0.0074	0.0121	-0.0506	0.824	63.8	0.0275
Z77 to SYFA (1)	-0.0012	0.0053	0.0032	0.097	65.0	0.0252
Z77 to X_155 (1)	0.0053	0.0010	0.0033	0.142	44.8	0.0258
Z77 to Z151 (1)	0.0043	-0.0151	0.0353	0.513	75.4	0.0273

RMS 0.0113 0.0109 0.0215

§ - This session is flagged as a 3-sigma outlier

CONTROL POINT RESIDUALS (ADJUSTMENT MADE)

STA. NAME	-- RE --	-- RN --	-- RH --
	(m)	(m)	(m)
A20	-0.0000	0.0004	0.0000
ATL01	0.0013	0.0025	-0.0036
ATL02	-0.0059	0.0040	0.0000
ATL03	-0.0008	0.0012	-0.0001
DUSTY	0.0033	-0.0037	0.0061
F82	-0.0006	-0.0009	0.0010
HLC_C	0.0046	-0.0023	0.0032
M98	-0.0004	0.0003	-0.0010
NEMC	-0.0007	0.0057	0.0023
SYFA	0.0003	-0.0039	-0.0003
X_155	0.0007	0.0000	-0.0032
Z151	-0.0016	-0.0035	-0.0010
Z77	-0.0001	0.0001	-0.0035

RMS	0.0024	0.0028	0.0027

OUTPUT STATION COORDINATES (LAT/LONG/HT)



STA_ID	--	LATITUDE	--	LONGITUDE	--	ELLHGT	-
A20	38	51	35.56381	-101	45	02.92660	1077.5350
ATL01	38	48	58.62634	-101	07	52.56617	921.2453
ATL02	38	50	58.74141	-100	30	05.26961	795.9789
ATL03	38	27	04.29179	-101	45	05.52331	1075.3612
DUSTY	39	19	21.17831	-101	08	26.00970	980.0126
F82	39	20	24.79512	-101	42	19.44036	1099.4984
GCP01	39	55	11.91702	-101	53	56.22115	1035.5658
GCP02	39	47	59.75210	-101	40	24.27608	1029.8358
GCP02_A	39	48	00.23555	-101	40	58.20982	1026.1388
GCP03	39	43	14.08933	-101	29	09.23584	1025.6591
GCP04	39	39	29.03525	-101	15	47.30984	920.8787
GCP05	39	31	55.54211	-101	03	13.05999	943.6867
GCP06	39	26	35.67813	-100	50	16.36831	898.3859
GCP07	39	57	26.28179	-102	01	48.39690	1056.3250
GCP104	39	11	01.51838	-102	01	28.57271	1189.2673
GCP105	39	27	03.16061	-102	02	31.09743	1160.3186
GCP106	39	45	41.27884	-102	03	45.51063	1120.3174
GCP108	39	54	06.38481	-101	33	35.75287	991.6885
GCP109	39	54	40.84429	-100	57	45.55939	895.2838
GCP113	38	15	16.49065	-101	11	43.24383	948.3738
GCP114	38	14	58.89937	-101	17	44.64284	965.9904
GCP115	38	24	11.20074	-101	13	12.85877	953.5929
GCP116	38	15	32.68257	-101	46	18.55858	1072.6591
GCP117	38	11	28.66541	-101	35	50.03952	1031.0140
GCP120	39	04	34.36467	-102	04	20.06286	1211.2555
GCP15	39	42	43.70948	-100	49	12.90612	834.6222
GCP16	39	49	40.23815	-101	03	00.12648	862.5365
GCP17	39	54	56.14058	-101	15	40.06631	965.9614
GCP18	39	59	18.27075	-101	31	24.00270	924.1781
GCP25	39	09	43.50294	-100	49	59.03896	895.9196
GCP26	39	15	51.26330	-101	07	48.38921	963.4336
GCP27	39	22	00.79740	-101	13	22.39637	987.5285
GCP28	39	28	04.49601	-101	26	27.73425	1030.9629
GCP29	39	31	30.24967	-101	41	18.64965	1065.8702
GCP30	39	37	35.37754	-101	47	22.73013	1088.4640
GCP31	39	20	10.67703	-101	52	28.88046	1129.9757
GCP32	39	14	59.55204	-101	39	08.12673	1086.5220
GCP33	39	10	40.07427	-101	25	44.54235	1024.3879
GCP34	39	05	15.58199	-101	13	13.34054	968.9507
GCP35	38	58	56.17711	-101	01	04.44804	939.9112
GCP36	38	53	16.23955	-100	50	37.48131	872.4826
GCP38	38	47	18.05102	-101	13	25.48905	913.1889
GCP39	38	54	13.45433	-101	25	32.29839	927.2101
GCP40	38	58	30.12745	-101	39	56.72373	1028.6462
GCP41	39	04	28.53238	-101	51	00.50565	1119.5084
GCP42	38	54	02.78586	-102	02	15.10871	1149.0057
GCP43	38	46	14.83388	-101	51	47.60720	1131.5293
GCP45	38	36	43.44507	-101	24	18.20964	1000.0796
GCP46	38	28	02.78792	-101	12	05.61832	952.7692
GCP47	38	16	40.98327	-101	24	05.63966	991.4869



GCP48 38 24 02.11365 -101 38 28.22535 1050.4617
GCP49 38 29 39.80960 -101 51 51.62003 1108.7573
GCP50 38 37 30.45951 -102 00 44.21765 1157.3525
GCP51 38 20 07.11093 -102 00 34.48226 1139.4022
GCP52 39 42 20.34580 -101 58 30.30545 1072.0242
GCP53 39 52 03.80980 -101 47 09.09768 1019.8390
GCP54 39 55 49.38106 -101 22 22.60695 987.7195
GCP55 39 45 23.92975 -101 33 39.77745 1040.2434
GCP56 39 34 08.31734 -101 47 21.86686 1072.0613
GCP57 39 23 38.95399 -101 58 03.61956 1142.5038
GCP58 39 06 13.19673 -101 58 44.63062 1175.5713
GCP59 39 18 27.55194 -101 44 36.91392 1109.2970
GCP60 39 28 55.95067 -101 31 48.89276 1045.8169
GCP61 39 41 03.77333 -101 22 25.82489 997.3322
GCP62 39 53 35.98588 -101 08 55.81868 926.5002
GCP63 39 54 30.98044 -100 46 48.12744 788.3694
GCP64 39 45 22.23503 -100 58 21.13512 917.0939
GCP65 39 39 18.76162 -101 05 05.81511 944.6882
GCP66 39 23 45.32713 -101 20 04.04369 1004.3970
GCP67 39 12 24.92158 -101 33 32.95713 1066.7830
GCP68 39 00 08.76827 -101 44 19.04508 1086.3079
GCP69 38 47 59.02533 -101 59 40.69830 1145.7230
GCP70 38 31 51.30347 -101 57 23.93207 1141.3181
GCP71 38 42 47.67988 -101 44 37.02932 1080.7720
GCP72 38 55 02.97427 -101 32 46.01172 964.7390
GCP73 39 07 18.48100 -101 19 51.46379 1002.4193
GCP74 39 19 23.33847 -101 12 16.19200 989.7727
GCP75 39 29 45.06982 -100 55 31.36993 916.7351
GCP76 39 37 07.30923 -100 56 42.02362 905.8983
GCP80 39 24 04.40107 -100 43 14.24714 882.6735
GCP81 39 12 19.54171 -101 02 14.60756 949.3384
GCP82 39 00 13.56406 -101 07 03.18942 946.2758
GCP83 38 50 20.75853 -101 18 56.36596 989.4619
GCP84 38 38 04.25390 -101 31 55.99521 1029.3923
GCP85 38 26 11.85886 -101 45 08.23442 1077.3704
GCP86 38 18 21.20854 -101 56 09.81233 1116.5975
GCP87 38 18 24.16024 -101 31 50.91471 1021.2175
GCP89 38 44 38.04136 -101 04 35.76362 891.4116
GCP99 38 47 08.50506 -100 56 47.62609 842.1041
HLC_C 39 22 26.08183 -99 49 59.81894 641.7582
M98 38 29 08.26965 -101 22 04.01058 983.7419
NEMC 40 11 57.84836 -100 34 41.39509 740.6813
SYFA 39 45 42.72587 -101 47 46.83969 1014.6767
X_155 39 45 34.74009 -100 30 57.57568 819.7496
Z151 39 14 04.92303 -100 27 41.13635 816.1857
Z77 39 44 48.08648 -101 02 16.37834 923.5815

OUTPUT STATION COORDINATES (GRID)



STA_ID	- EASTING -	- NORTHING -	- ELLHGT -
	(m)	(m)	(m)
A20	261313.4838	4304823.8684	1077.5350
ATL01	314964.2043	4298547.6067	921.2453
ATL02	369707.7015	4301163.3600	795.9789
ATL03	259889.1241	4259464.4430	1075.3612
DUSTY	315481.2599	4354755.9879	980.0126
F82	266843.5044	4358023.3018	1099.4984
GCP01	252238.9976	4422899.5967	1035.5658
GCP02	271118.7579	4408971.3179	1029.8358
GCP02_A	270312.0971	4409010.3918	1026.1388
GCP03	286929.6604	4399699.9665	1025.6591
GCP04	305849.3306	4392254.7746	920.8787
GCP05	323505.0914	4377840.2123	943.6867
GCP06	341847.1533	4367577.5171	898.3859
GCP07	241168.3014	4427415.7196	1056.3250
GCP104	238748.3434	4341527.3873	1189.2673
GCP105	238246.3596	4371230.4611	1160.3186
GCP106	237643.4723	4405769.9698	1120.3174
GCP108	281159.2095	4419992.3293	991.6885
GCP109	332246.0018	4419761.3656	895.2838
GCP113	307911.6808	4236341.0374	948.3738
GCP114	299113.3363	4236012.0323	965.9904
GCP115	306129.6686	4252876.6200	953.5929
GCP116	257477.8265	4238195.0675	1072.6591
GCP117	272544.9587	4230228.7447	1031.0140
GCP120	234228.5928	4329727.9411	1211.2555
GCP15	343968.5193	4397392.4298	834.6222
GCP16	324564.1544	4410660.5131	862.5365
GCP17	306744.2673	4420836.6707	965.9614
GCP18	284560.2800	4429520.4331	924.1781
GCP25	341628.8167	4336363.6654	895.9196
GCP26	316229.7108	4348262.7877	963.4336
GCP27	308504.7588	4359848.6662	987.5285
GCP28	290013.2312	4371548.0584	1030.9629
GCP29	268911.0123	4378498.6067	1065.8702
GCP30	260566.3949	4390022.1530	1088.4640
GCP31	252237.6546	4358038.7764	1129.9757
GCP32	271129.8870	4347859.0687	1086.5220
GCP33	290179.8050	4339318.0001	1024.3879
GCP34	307961.5743	4328851.3499	968.9507
GCP35	325215.0935	4316745.9036	939.9112
GCP36	340089.2565	4305946.2499	872.4826
GCP38	306858.9514	4295638.3226	913.1889
GCP39	289661.9957	4308891.3785	927.2101
GCP40	269068.7934	4317386.6011	1028.6462
GCP41	253439.5815	4328921.5033	1119.5084
GCP42	236581.6243	4310152.5916	1149.0057
GCP43	251247.8948	4295235.0286	1131.5293
GCP45	290595.6426	4276472.3694	1000.0796
GCP46	307931.4131	4259976.7636	952.7692
GCP47	289933.0263	4239394.2329	991.4869
GCP48	269360.2336	4253565.8428	1050.4617



GCP49	250192.7163	4264559.5500	1108.7573
GCP50	237763.4729	4279483.1951	1157.3525
GCP51	236946.5444	4247306.7008	1139.4022
GCP52	244939.3180	4399320.7844	1072.0242
GCP53	261724.6582	4416791.0182	1019.8390
GCP54	297230.1367	4422726.4843	987.7195
GCP55	280602.0949	4403885.0158	1040.2434
GCP56	260388.6953	4383636.7313	1072.0613
GCP57	244433.4501	4364720.3413	1142.5038
GCP58	242390.4988	4332506.7556	1175.5713
GCP59	263442.1902	4354507.5156	1109.2970
GCP60	282382.6291	4373346.3773	1045.8169
GCP61	296429.0149	4395421.3230	997.3322
GCP62	316282.9640	4418128.0484	926.5002
GCP63	347849.9555	4419130.0033	788.3694
GCP64	331021.3053	4402556.3603	917.0939
GCP65	321130.1307	4391567.6113	944.6882
GCP66	298975.7816	4363314.1714	1004.3970
GCP67	279030.2867	4342860.0240	1066.7830
GCP68	262846.9449	4320615.3791	1086.3079
GCP69	239933.9133	4298813.4627	1145.7230
GCP70	242270.9826	4268868.5879	1141.3181
GCP71	261449.1939	4288529.4369	1080.7720
GCP72	279256.1989	4310703.0169	964.7390
GCP73	298492.9600	4332880.1449	1002.4193
GCP74	309970.6860	4354955.0998	989.7727
GCP75	334441.8230	4373573.8500	916.7351
GCP76	333048.9987	4387245.0900	905.8983
GCP80	351848.8725	4362714.4632	882.6735
GCP81	324082.4923	4341551.0958	949.3384
GCP82	316638.3623	4319327.7796	946.2758
GCP83	299018.0345	4301469.3781	989.4619
GCP84	279591.0092	4279261.6288	1029.3923
GCP85	259775.0772	4257849.8741	1077.3704
GCP86	243270.0265	4243834.5742	1116.5975
GCP87	278713.4701	4242876.7069	1021.2175
GCP89	319528.4133	4290404.8468	891.4116
GCP99	330929.3611	4294794.8909	842.1041
HLC_C	428225.3706	4358602.4053	641.7582
M98	293480.1570	4262355.4139	983.7419
NEMC	365678.0758	4451083.4864	740.6813
SYFA	260460.3152	4405067.8243	1014.6767
X_155	370139.9243	4402180.1895	819.7496
Z151	373868.8646	4343839.6699	816.1857
Z77	325399.0701	4401628.8124	923.5815

OUTPUT VARIANCE/COVARIANCE

2

STA_ID SE/SN/SUP ----- CX matrix (m)-----

(95.00 %) (not scaled by confidence level)
(m) (ECEF, XYZ cartesian)

A20 0.0086 1.3206e-005
 0.0094 2.4356e-006 1.8563e-005
 0.0112 2.9916e-007 -2.8080e-006 1.6339e-005

ATL01 0.0069 8.3801e-006
 0.0080 1.9822e-006 1.4717e-005
 0.0103 -2.9921e-007 -3.2856e-006 1.3133e-005

ATL02 0.0085 1.2566e-005
 0.0096 1.6911e-006 1.8411e-005
 0.0112 6.3805e-007 -2.7621e-006 1.7388e-005

ATL03 0.0090 1.4173e-005
 0.0097 2.3007e-006 1.8893e-005
 0.0113 2.6055e-007 -2.7160e-006 1.7133e-005

DUSTY 0.0070 8.5836e-006
 0.0079 1.7576e-006 1.4594e-005
 0.0102 -2.2974e-007 -3.1982e-006 1.2713e-005

F82 0.0083 1.2052e-005
 0.0090 2.2173e-006 1.7245e-005
 0.0110 4.7438e-008 -3.1921e-006 1.5915e-005

GCP01 0.0245 1.2574e-004
 0.0302 7.7087e-005 2.4701e-004
 0.0427 2.0154e-005 -7.4723e-005 1.8247e-004

GCP02 0.0193 7.4509e-005
 0.0260 4.3029e-005 1.8820e-004
 0.0399 -1.5929e-005 -7.3739e-005 1.7801e-004

GCP02_A 0.0213 1.0184e-004
 0.0254 9.4498e-005 3.8699e-004
 0.0568 -4.2118e-005 -1.9841e-004 2.3352e-004

GCP03 0.1210 1.9661e-003
 0.0642 -1.0524e-003 3.6771e-003
 0.1444 3.9908e-004 -1.3166e-003 9.6706e-004

GCP04 0.0223 1.0560e-004
 0.0272 8.5452e-005 3.7853e-004
 0.0511 -3.8698e-005 -1.3106e-004 1.5836e-004

GCP05 0.0224 1.0482e-004
 0.0270 8.3248e-005 3.7681e-004
 0.0508 -3.6157e-005 -1.2942e-004 1.5393e-004

GCP06 0.0254 1.3254e-004
 0.0264 1.0757e-004 5.5630e-004
 0.0691 -3.5606e-005 -3.2103e-004 3.3207e-004

GCP07 0.0202 9.0320e-005
0.0285 7.8523e-005 3.0830e-004
0.0503 -4.7185e-005 -1.2900e-004 2.2630e-004

GCP104 0.0286 2.1927e-004
0.0310 2.8049e-004 9.3526e-004
0.0915 -1.3788e-004 -5.6630e-004 5.4087e-004

GCP105 0.0188 7.5916e-005
0.0276 5.8470e-005 2.3523e-004
0.0519 -5.8330e-005 -1.6238e-004 3.2396e-004

GCP106 0.0255 1.2432e-004
0.0271 8.0138e-005 5.1202e-004
0.0672 -2.2318e-005 -3.0602e-004 3.4780e-004

GCP108 0.0224 1.3559e-004
0.0281 1.7497e-004 5.5539e-004
0.0642 -6.6596e-005 -2.3892e-004 2.1279e-004

GCP109 0.1041 1.5127e-003
0.0585 -6.8368e-004 2.6230e-003
0.1211 2.8809e-004 -8.7780e-004 6.9120e-004

GCP113 0.0228 1.0114e-004
0.0259 5.3056e-005 2.4602e-004
0.0403 -7.4477e-006 -6.4975e-005 1.2271e-004

GCP114 0.0255 1.4678e-004
0.0300 1.0920e-004 2.4766e-004
0.0436 6.3487e-006 -7.6267e-005 1.8166e-004

GCP115 0.0198 9.1188e-005
0.0275 8.7419e-005 2.8890e-004
0.0562 -7.4992e-005 -1.9834e-004 3.3900e-004

GCP116 0.0194 7.7167e-005
0.0296 4.9866e-005 2.0316e-004
0.0435 -1.1518e-005 -9.0061e-005 2.4407e-004

GCP117 0.0236 1.2077e-004
0.0299 8.2217e-005 2.2886e-004
0.0425 1.6983e-005 -7.5457e-005 1.9299e-004

GCP120 0.0238 1.1592e-004
0.0435 8.9390e-005 4.5926e-004
0.0883 -1.1267e-004 -5.6119e-004 1.1359e-003

GCP15 0.0195 8.3871e-005
0.0272 7.4315e-005 2.8848e-004
0.0534 -5.5594e-005 -1.7035e-004 2.9111e-004

GCP16 0.0217 8.6745e-005
0.0285 5.5109e-005 4.3334e-004
0.0575 -5.9192e-005 -1.8592e-004 2.4617e-004

GCP17 0.0211 1.1136e-004
0.0256 1.3113e-004 4.5942e-004
0.0594 -5.2168e-005 -2.1032e-004 2.0118e-004

GCP18 0.2131 7.5025e-003
0.0750 -6.8692e-004 2.7593e-003
0.1301 2.0074e-004 -8.7367e-004 1.0839e-003

GCP25 0.0197 8.0488e-005
0.0345 5.2688e-005 1.9255e-004
0.0476 -2.4562e-005 -1.0592e-004 3.6909e-004

GCP26 0.0119 2.9144e-005
0.0165 1.9997e-005 8.0229e-005
0.0300 -1.9642e-005 -5.3165e-005 1.0994e-004

GCP27 0.0218 1.0274e-004
0.0276 1.0462e-004 5.3238e-004
0.0670 -9.5072e-005 -2.8005e-004 3.2011e-004

GCP28 0.0193 7.5351e-005
0.0253 4.6507e-005 2.0392e-004
0.0412 -1.8040e-005 -8.3956e-005 1.7372e-004

GCP29 0.0252 1.0898e-004
0.0443 9.0825e-005 9.1945e-004
0.1187 -1.0901e-004 -1.1123e-003 1.7563e-003

GCP30 0.0269 1.6257e-004
0.0286 1.3831e-004 4.8670e-004
0.0659 -1.0801e-004 -2.6480e-004 3.3318e-004

GCP31 0.0201 7.0304e-005
0.0274 2.6586e-005 2.4759e-004
0.0412 -1.3070e-005 -6.9641e-005 1.5778e-004

GCP32 0.0182 6.7489e-005
0.0266 4.6127e-005 2.1271e-004
0.0453 -3.4227e-005 -1.1114e-004 2.3538e-004

GCP33 0.1469 3.0645e-003
0.0947 -1.3360e-003 3.5555e-003
0.1264 1.1110e-004 -4.3380e-004 1.1452e-003

GCP34 0.0228 1.0674e-004
0.0298 6.6133e-005 2.4774e-004
0.0439 1.8566e-005 -8.6686e-005 2.0144e-004

GCP35 0.0234 1.4705e-004

0.0265 1.9055e-004 5.8445e-004
0.0671 -7.9627e-005 -2.6970e-004 2.2850e-004

GCP36 0.0241 1.1178e-004
0.0402 1.0197e-004 7.5134e-004
0.1036 -1.0879e-004 -8.3020e-004 1.2945e-003

GCP38 0.0200 8.2228e-005
0.0332 5.5173e-005 2.2360e-004
0.0485 -1.8751e-005 -1.1564e-004 3.3723e-004

GCP39 0.0190 6.8673e-005
0.0292 4.1867e-005 2.6837e-004
0.0467 -2.1099e-005 -1.0688e-004 2.2976e-004

GCP40 0.0201 8.4933e-005
0.0270 6.4016e-005 2.7670e-004
0.0442 -2.8454e-005 -8.5951e-005 1.5393e-004

GCP41 0.0205 8.8159e-005
0.0347 5.8170e-005 2.1601e-004
0.0495 -2.4400e-005 -1.1874e-004 3.7509e-004

GCP42 0.0181 6.3490e-005
0.0273 3.8107e-005 2.1901e-004
0.0437 -2.2254e-005 -9.5788e-005 2.1576e-004

GCP43 0.0219 9.2792e-005
0.0263 5.9122e-005 3.5131e-004
0.0484 -1.4319e-005 -1.1652e-004 1.4282e-004

GCP45 0.0245 1.1750e-004
0.0246 6.7854e-005 3.4042e-004
0.0514 -3.8755e-005 -1.5007e-004 1.8419e-004

GCP46 0.0189 6.6398e-005
0.0314 3.9230e-005 2.7641e-004
0.0476 -8.3952e-006 -1.0697e-004 2.5912e-004

GCP47 0.0205 9.1750e-005
0.0310 7.0105e-005 2.3901e-004
0.0482 -1.5626e-005 -1.1986e-004 2.8818e-004

GCP48 0.0216 1.0198e-004
0.0288 8.3027e-005 3.1481e-004
0.0449 -2.5860e-005 -7.4251e-005 1.3567e-004

GCP49 0.0225 1.0628e-004
0.0268 8.2465e-005 3.7636e-004
0.0509 -3.6279e-005 -1.2770e-004 1.5519e-004

GCP50 0.0240 1.2010e-004
0.0304 7.2875e-005 2.5193e-004

0.0440 1.8269e-005 -8.3537e-005 2.0106e-004

GCP51 0.0248 1.1648e-004
0.0297 9.5615e-005 6.9001e-004
0.0918 -8.9567e-005 -6.6093e-004 8.5069e-004

GCP52 0.0233 1.0687e-004
0.0366 6.4820e-005 3.4448e-004
0.0718 -8.7632e-005 -3.4780e-004 7.2461e-004

GCP53 0.0194 7.6602e-005
0.0298 4.5618e-005 1.8716e-004
0.0433 -2.1556e-005 -8.6448e-005 2.6011e-004

GCP54 0.0255 1.2578e-004
0.0270 8.6876e-005 5.3499e-004
0.0687 -2.6130e-005 -3.2261e-004 3.5760e-004

GCP55 0.0277 1.7177e-004
0.0310 1.2325e-004 2.9416e-004
0.0468 1.0639e-006 -9.2536e-005 1.8776e-004

GCP56 0.0246 1.2223e-004
0.0309 8.0017e-005 3.7070e-004
0.0608 -6.4762e-005 -2.2349e-004 3.8363e-004

GCP57 0.0179 6.2578e-005
0.0269 3.7656e-005 2.0783e-004
0.0423 -2.0821e-005 -8.6798e-005 2.0279e-004

GCP58 0.0198 7.9719e-005
0.0247 5.1912e-005 2.4173e-004
0.0442 -2.1565e-005 -1.0404e-004 1.7213e-004

GCP59 0.0129 2.8847e-005
0.0163 8.0061e-006 8.4913e-005
0.0238 -1.1465e-006 -2.2597e-005 5.3075e-005

GCP60 0.0212 1.1026e-004
0.0252 1.2178e-004 4.1738e-004
0.0569 -4.8850e-005 -1.9067e-004 1.9395e-004

GCP61 0.0234 1.0578e-004
0.0348 6.0584e-005 3.3437e-004
0.0680 -8.1441e-005 -3.0526e-004 6.2521e-004

GCP62 0.0188 7.1858e-005
0.0285 4.4674e-005 1.8482e-004
0.0424 -2.2215e-005 -8.4254e-005 2.3814e-004

GCP63 0.0247 1.1383e-004
0.0270 4.2431e-005 2.2605e-004
0.0428 7.4056e-006 -9.1807e-005 1.8938e-004

GCP64 0.0119 2.5917e-005
0.0169 1.2652e-005 8.8114e-005
0.0261 -4.6772e-006 -3.1553e-005 7.0860e-005

GCP65 0.0185 7.4965e-005
0.0275 6.3541e-005 2.3871e-004
0.0503 -5.3439e-005 -1.4623e-004 2.9171e-004

GCP66 0.0253 1.0386e-004
0.0377 1.4188e-005 3.2647e-004
0.0600 2.3552e-005 -2.1296e-004 5.1365e-004

GCP67 0.0203 1.0167e-004
0.0274 1.0713e-004 3.2902e-004
0.0576 -8.1865e-005 -2.0211e-004 3.1755e-004

GCP68 0.0250 1.3400e-004
0.0299 8.7079e-005 2.5532e-004
0.0438 1.2909e-005 -8.0797e-005 1.8437e-004

GCP69 0.0201 8.6134e-005
0.0279 6.9060e-005 3.0371e-004
0.0468 -3.3038e-005 -9.9463e-005 1.7356e-004

GCP70 0.0204 8.7969e-005
0.0357 5.7754e-005 2.0598e-004
0.0495 -2.9556e-005 -1.1727e-004 3.9752e-004

GCP71 0.0247 1.2535e-004
0.0291 8.3665e-005 3.7189e-004
0.0573 -5.7324e-005 -1.8990e-004 2.9483e-004

GCP72 0.0232 1.3801e-004
0.0296 1.5054e-004 4.0157e-004
0.0650 -1.2421e-004 -2.6116e-004 4.0217e-004

GCP73 0.0215 8.5087e-005
0.0352 3.2433e-005 2.0669e-004
0.0508 6.0190e-006 -1.4021e-004 4.2296e-004

GCP74 0.0118 2.5975e-005
0.0174 1.4325e-005 9.4472e-005
0.0259 -4.6594e-006 -2.7732e-005 6.5450e-005

GCP75 0.0233 1.0443e-004
0.0341 5.7788e-005 3.2769e-004
0.0662 -7.8862e-005 -2.8713e-004 5.8337e-004

GCP76 0.0195 7.1225e-005
0.0300 4.2809e-005 2.9827e-004
0.0452 -1.5784e-005 -8.4303e-005 1.8549e-004

GCP80 0.0226 1.3586e-004
 0.0274 1.7692e-004 5.4537e-004
 0.0640 -6.8219e-005 -2.3857e-004 2.1443e-004

GCP81 0.0267 1.4742e-004
 0.0289 8.9380e-005 2.8021e-004
 0.0459 -5.5289e-007 -9.7066e-005 1.8269e-004

GCP82 0.0207 9.2092e-005
 0.0238 7.9689e-005 3.4993e-004
 0.0543 -3.7399e-005 -1.8327e-004 2.1679e-004

GCP83 0.0933 1.8688e-003
 0.0661 1.0943e-003 1.9605e-003
 0.1135 -3.9698e-004 -4.5175e-004 5.0000e-004

GCP84 0.0221 1.2834e-004
 0.0272 1.6421e-004 5.6529e-004
 0.0649 -6.0728e-005 -2.4474e-004 2.1359e-004

GCP85 0.0129 3.3316e-005
 0.0171 1.9513e-005 8.3132e-005
 0.0299 -1.7330e-005 -5.1189e-005 1.0870e-004

GCP86 0.0213 9.9622e-005
 0.0251 8.0066e-005 2.9967e-004
 0.0464 -1.7207e-005 -1.0751e-004 1.4120e-004

GCP87 0.0207 7.7700e-005
 0.0241 3.1518e-005 2.3438e-004
 0.0439 -4.9314e-006 -1.0905e-004 1.7804e-004

GCP89 0.0186 6.9129e-005
 0.0238 4.2979e-005 1.9997e-004
 0.0404 -1.7530e-005 -8.3296e-005 1.5640e-004

GCP99 0.0216 1.2494e-004
 0.0260 1.6469e-004 5.2159e-004
 0.0630 -6.5095e-005 -2.3313e-004 2.0569e-004

HLC_C 0.0099 1.5992e-005
 0.0090 -4.3093e-007 1.8364e-005
 0.0107 -9.1723e-008 -2.3699e-006 1.4506e-005

M98 0.0086 1.2785e-005
 0.0094 2.0460e-006 1.8243e-005
 0.0111 4.8801e-007 -2.9666e-006 1.6699e-005

NEMC 0.0088 1.3396e-005
 0.0096 1.8569e-006 1.8512e-005
 0.0113 1.6018e-007 -2.8781e-006 1.7704e-005

SYFA 0.0090 1.3668e-005



0.0097 1.1496e-006 1.9420e-005
0.0112 4.3023e-007 -2.5477e-006 1.6983e-005

X_155 0.0088 1.3488e-005
0.0094 1.7450e-006 1.8224e-005
0.0112 1.2749e-007 -2.9395e-006 1.6954e-005

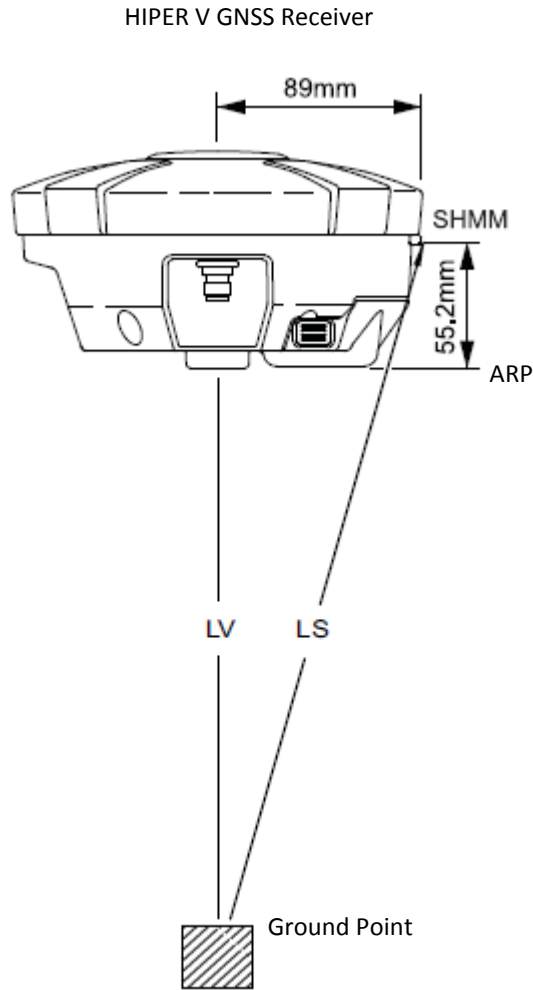
Z151 0.0073 9.2630e-006
0.0079 1.2489e-006 1.4211e-005
0.0099 -1.7854e-007 -2.8488e-006 1.2207e-005

Z77 0.0073 9.4329e-006
0.0082 2.1592e-006 1.4840e-005
0.0103 -6.7058e-008 -3.2116e-006 1.3671e-005

VARIANCE FACTOR = 0.6977

Note: Values < 1.0 indicate statistics are pessimistic, while
values > 1.0 indicate optimistic statistics. Entering this
value as the network adjustment scale factor will bring
variance factor to one.

1.5 GNSS Receiver Diagrams

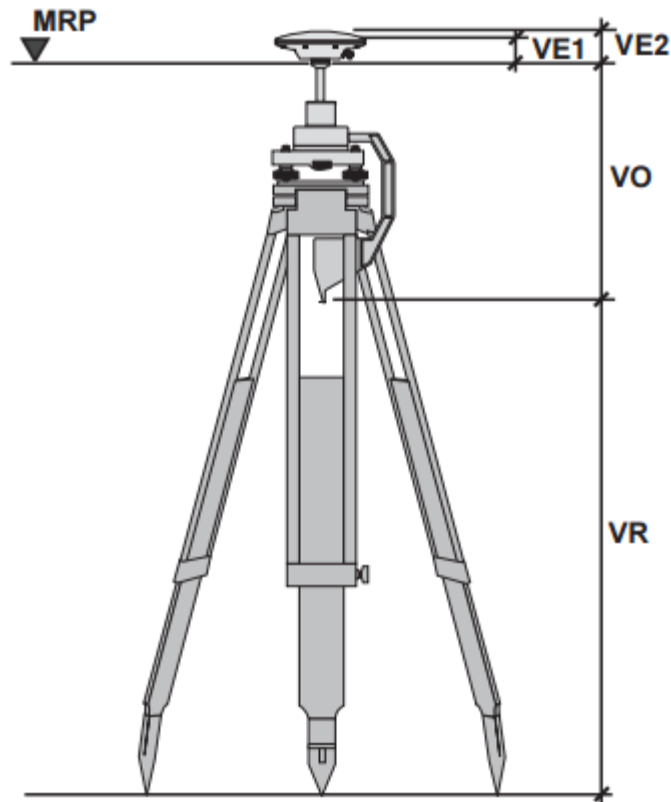


ARP = Antenna Reference Point
 LV = Level Vertical
 LS = Level Slope
 SHMM = Slant Height Measurement Mark

Note:

Fixed Rod setup would use the LV measurement.
 Tripod setup would use the LS measurement and
 Calculate the LV measurement.

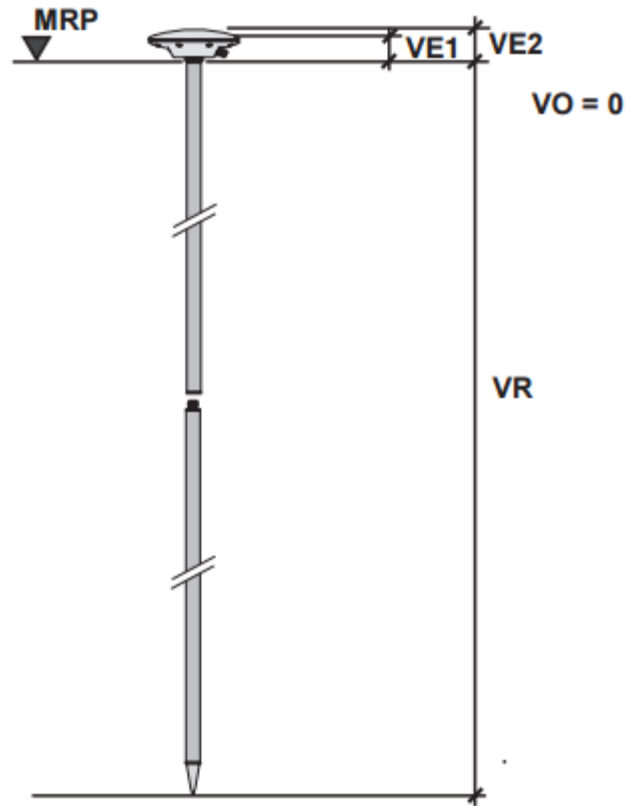
Leica SR530 GPS Receiver
(Tripod setup measurement)



- VO = Vertical Offset (0.36m standard offset for tripod setup)
- VR = Vertical Height Reading
- VE1 = Vertical Phase Center Eccentricity for L1
- VE2 = Vertical Phase Center Eccentricity for L2 MRP Mechanical Reference Plane
- MRP = Mechanical Reference Plane (Also known as ARP = Antenna Reference Point)

VO + VR (0.36m) = Vertical Height to MRP

Leica SR530 GPS Receiver
 (Fixed Rod setup)



- VO = Vertical Offset (0.00m standard offset for fixed rod setup)
- VR = Vertical Height Reading
- VE1 = Vertical Phase Center Eccentricity for L1
- VE2 = Vertical Phase Center Eccentricity for L2 MRP Mechanical Reference Plane
- MRP = Mechanical Reference Plane (Also known as ARP = Antenna Reference Point)

1.6 Custody Transference Assurance

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