

**Government of Grenada Regional Disaster Vulnerability Reduction
Project, Grenada**

Consultancy for Preparation of Detailed
Specifications and Scope of Works for
Geodetic Survey and Provision of
Supervision Services during Survey

Final Report

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Abbreviations

3D	3 Dimensional
BWI	British West Indies
EGM2008	Earth Gravitational Model 2008
FBM	Fundamental Bench Mark
GPS	Global Positioning System
ITRF	International Terrestrial Reference Frame
ITRS	International Terrestrial Reference System
MSL	Mean Sea Level
NGPP	National Grid Pilot Project
NGS	National Geodetic Survey
RINEX	Receiver Independent Exchange Format
TGBM	Tide Gauge Bench Mark

Executive Summary

Purpose. This document is a final report for the Consultancy for Preparation of Detailed Specifications and Scope of Works for Geodetic Survey and Provision of Supervision Services during Survey in Grenada.

Overview. This document provides details on the main deliverables, installations made under the project and summary results of survey work together with issues arising that lead to inconsistencies and anomalous findings. Includes also any future work to be undertaken in support of further development of the geodetic network.

Objective of the Consultancy

Main objective of the consultancy was to provide technical assistance and supervision for establishment of a countrywide geodetic network that will provide a basis for definition and realization of a modern geodetic reference system.

The assignment included development of Terms of Reference for a surveying firm to undertake geodetic surveys across the country. The results of survey work were used for realization of horizontal and vertical geodetic datums that form a foundation of the national spatial data infrastructure.

The assignment also included supervision of the survey and verification of the results to ensure data and information quality.

The New Geodetic Reference System

Geodetic Datum

The new geodetic datum is based and aligned with the International Terrestrial Reference System¹ and complemented by the EGM2008 geoid representing the difference between GPS-determined and gravity-related heights.

Vertical Reference

The vertical reference frame is based on a geoid² and orthometric heights with an origin point at triangulation station GS8, which is also the origin point of the Grenada 1950 Datum. G8 (Santa Maria) has a precisely determined orthometric height with respect to the old datum:

$$H_0 = 48.841 \text{ m (160.24 ft)},$$

According to the historical records, that height was “determined by leveling from the Colony bench mark at St. Georges Harbor, which is 0.966 m (3.17 ft) above mean sea level”.

¹ The current realization of the ITRS that was implemented in Grenada is ITRF2014, published by the IERS on 22 January 2016.

² Analysis of data from Prickly Bay shows that existing tidal data are not suitable for definition of a tidal datum because they span a period shorter than the 19-year metonic cycle. The MSL defined from the current instead of the full set, could be significantly offset from the long-term average.

Projection System

Based on a distortion analysis of the extent to which distortion on the British West Indies Grid, UTM system and Transverse Mercator Projection centered on Grenada varies across the country, it is concluded that the currently used British West Indies Grid should not be replaced by a new projection system, but should be used on the new ITRF2014 based datum.

Standards for Geodetic Surveys

The positional accuracy necessary to keep the new system consistent are given in Table 1, where standard deviation (or σ) represents the uncertainty in the horizontal coordinates with respect to the ITRF2014 datum at the 68% confidence level.

Table 1 Positional accuracy of geodetic control points.

Class	Standard Deviation (σ)		Type	Description
	Horizontal Position	Vertical Position		
0	Coordinates are treated as "error-free"	Coordinates are treated as "error-free"	CORS	Continuously Operating Reference Stations.
1	$\sigma \leq 15$ mm	$\sigma \leq 30$ mm	Primary control	Stations from the national geodetic network.
2	$\sigma \leq 20$ mm	$\sigma \leq 40$ mm	Secondary control	Control point positions determined from the primary control.

Website Associated with the National Geodetic Network

It is recommended to develop a website associated with the National Geodetic Network. The website shall provide data and metadata associated with the national geodetic network and online tools for conversion of coordinates, transformation between geodetic datums, generation of epoch coordinates from observations made at other times, and computation of geoidal heights.

Results of Survey Work

Survey work for establishment of the new national geodetic network was contracted through competitive bidding. The contractor performed all fieldwork, analyses and office

computations necessary for establishment of the network stations on the ground including field reconnaissance, monumentation, observation campaign post-processing of observation data and computation of transformation parameters.

Network Design

The network was developed as a two-level system with a first level made up of the centrally operated CORS network sites, and a second level of all other sites positioned relative to the CORS stations.

For establishment of the second level, the contractor installed 41 new points, which were measured together with 33 stations from the existing trig network and 9 points from the NGPP³ network in southwestern Grenada. The network also includes the tide gauge bench marks at St. George's Harbor and Prickley Bay.

For each new site, intervisibility with neighboring stations was checked and in case of no intervisibility, the main monument was equipped with 1 intervisible reference mark within 50-500 m for orientation purpose, or in case of monument destruction.

The measured existing points were used for computation of transformation parameters between Grenada 1953 and ITRF2014 datums and between NGPP and ITRF2014 datums.

Monumentation

The contractor was required to monument the GPS stations mainly by setting the survey markers in bedrock, which will allow to achieve the highest possible stability of the monuments. Where it was not possible, the stations were monumented by prefabricated concrete blocks buried in the ground (Figure 1). Each monument is emplaced 1.30 m below the ground level. The survey marker on the top is made of aluminum alloy cemented at the center of the monument (Figure 2). Each monument has a fiberglass witness post buried 1-2 m from the monument (Figure 1).

³ The network established within the National Grid Pilot Project includes 99 control points measured with GPS in southwestern Grenada with the objective to increase the number of control points.



Figure 1. GN27 – overview.



Figure 2. GN27 – close view.

Determination of Station Positions

The station positions are computed from static GPS data. At the main monuments and existing points, the measurements were made simultaneously with 4 geodetic grade receivers. The survey involved continuous collection of 45-60^m precise code and carrier phase measurements at 15^s recording rate and 10^o-elevation cut-off angle.

The positions computed from the acquired data meet accuracy specifications for 1st order, which require standard deviation of ≤ 15 mm in horizontal and ≤ 30 mm in vertical position at the 95% confidence level.

Back-up of the Vertical System

To back up the vertical system, a new fundamental bench mark (GN32) was established in the Botanical Gardens. FBM is monumented by an NGS 3D, Top Security Sleeve monument ensuring long-term stability. It is secured by reference mark OM32 2 located in close proximity and monumented in a solid concrete block.

Station GS8 from the existing network was tied by a double run precise spirit leveling to station GN31 (St. George's Harbor), station GN32 and OM32 2 (Botanical Gardens), and GN37 (Prickly Bay). The levelling also included LAS006, LAS009, LAS013 and OM32-1 (Botanical Garden). The adjusted orthometric heights for the points by keeping the orthometric height of G8 fixed to its original value of 48.841 m are given in Table 2.

Table 2. Adjusted orthometric heights from precise spirit levelling.

Point	Orthometric Height [m]
GN37	1.970
GS8	48.841
GN31	0.895
GN32	10.258
OP32 2	10.770
LAS006	2.523
LAS009	15.279
LAS013	7.840
OM32-1	15.436



Figure 3. FBM (GN32) – overview.



Figure 4. GN32 (FBM) – close view.

Shift between EGM2008 and the Vertical System

The shift between EGM2008 and the Vertical System in Grenada is estimated at - 0.267 m. The computation of orthometric height from GPS measurement with respect to the Vertical System in Grenada should use the formula:

$$H \approx h - N - 0.267 \text{ m},$$

where:

h is ellipsoidal height determined from GPS measurements;

N is the departure of the geoid from the geocentric reference ellipsoid (geoidal height or undulation) computed using the EGM2008 model.

Transformation Parameters between Grenada 1953 and ITRF2014 Datums

The transformation parameters between Grenada 1950 and ITRF2014 datums are given in Table 3.

Table 3. Transformation parameters between Grenada 1950 ITRF2014 datums.

From Grenada 1953 to ITRF2014		From ITRF2014 to Grenada 1953	
ΔX	71.494 m	ΔX	- 71.494 m
ΔY	215.817 m	ΔY	-215.817 m
ΔZ	93.094 m	ΔZ	-93.094 m

The parameters were computed from 30 identical points. The horizontal post transformation residuals are between 0.046 m and 0.375 m. The reansformation is not valid for Carriacou and Green Islands.

The contractor also prepared a transformation grids allowing conversion between UTM 20 coordinates on the ITRF2014 datum and BWI coordinates on Grenada 1950 Datum using Excel. The grid is eventually more accurate than the 3 parameter model between Grenada 1953 and ITRF2014 (see the previous section) but it can be used with caution because the differences can reach 0.15 m.

Transformation Parameters between NGPP and ITRF2014 Datums

The transformation parameters between NGPP and ITRF2014 datums are given in Table 3.

Table 4. Transformation parameters between NGPP and ITRF2014 datums.

From NGPP Datum to ITRF2014 Datum		From ITRF2014 Datum to NGPP Datum	
ΔX	-17.530 m	ΔX	17.530 m
ΔY	30.051 m	ΔY	-30.051 m
ΔZ	-9.433 m	ΔZ	9.433 m

The parameters were computed from 9 identical points. The horizontal post transformation residuals are between 0.008 m and 0.058 m.

Tables of Coordinates

Table 5. Station positions at Epoch 2018.07 referred to the ITRF2014 Datum.

ITRF 2014 at Epoch 2018.07

Point	Geographic Coordinates		Ellips Height [m]	Cartesian Coordinates			UTM 20 Coordinates		BWI Coordinates		Orthom Height [m]	Source
	Latitude	Longitude		X [m]	Y [m]	Z [m]	Easting [m]	Northing [m]	Easting [m]	Northing [m]		
New Points												
GN01	12°31'32.1121"N	61°26'21.7834"W	-0.35				669570.10	1385174.02	460902.12	1384599.18	35.87	Measured
GN02	12°30'18.1853"N	61°25'48.6375"W	-23.75				670584.23	1382908.35	461907.27	1382330.62	12.50	Measured
GN03	12°29'51.3760"N	61°26'56.2178"W	-15.55				668548.72	1382072.53	459869.44	1381502.84	20.74	Measured
GN04	12°29'12.5764"N	61°25'36.9923"W	-24.03				670947.80	1380894.42	462263.08	1380316.16	12.25	Measured
GN05	12°28'56.5296"N	61°27'20.3937"W	-33.91				667828.63	1380382.97	459143.27	1379816.70	2.41	Measured
GN06	12°28'28.4815"N	61°28'31.3031"W	-33.44				665692.57	1379508.74	457004.79	1378950.88	2.95	Measured
GN07	12°28'40.7131"N	61°26'04.1089"W	-28.96				670134.83	1379910.48	461446.74	1379335.71	7.34	Measured
GN08	12°28'13.4219"N	61°29'15.8046"W	6.92				664351.51	1379038.31	455662.50	1378485.69	43.37	Measured
GN09	12°27'53.6590"N	61°27'34.0167"W	-8.54				667428.52	1378448.73	458736.04	1377884.77	27.80	Measured
GN10	12°27'29.5691"N	61°28'54.0203"W	-34.83				665016.99	1377694.60	456322.65	1377140.02	1.58	Measured
GN11	12°27'01.8528"N	61°28'10.2487"W	4.82				666343.64	1376850.55	457645.59	1376291.32	41.18	Measured
GN12	12°12'37.4575"N	61°37'17.9507"W	50.26				649941.49	1350201.48	441150.45	1349713.67	86.65	Measured
GN13	12°13'20.1931"N	61°38'25.1630"W	4.46				647903.54	1351504.24	439118.05	1351023.49	40.94	Measured
GN14	12°12'29.4365"N	61°39'51.3824"W	134.04				645305.57	1349931.80	436515.20	1349461.20	170.51	Measured
GN15	12°12'50.0349"N	61°41'22.3940"W	-18.36				642551.90	1350551.24	433764.78	1350090.58	18.29	Measured
GN16	12°11'26.2464"N	61°38'35.2631"W	83.81				647615.83	1348001.76	438817.53	1347523.32	120.14	Measured
GN17	12°11'33.8192"N	61°42'16.1238"W	-22.69				640939.29	1348201.79	432144.05	1347747.89	13.88	Measured
GN18	12°10'22.9082"N	61°37'09.4292"W	14.19				650220.07	1346068.80	441413.71	1345581.47	50.48	Measured
GN19	12°09'31.8677"N	61°43'52.4410"W	-32.20				638045.71	1344441.26	429237.60	1343999.27	4.31	Measured
GN20	12°09'21.0929"N	61°37'23.2392"W	25.26				649812.26	1344167.43	440999.05	1343682.29	61.53	Measured
GN21	12°08'28.1293"N	61°42'03.4248"W	348.56				641350.37	1342498.54	432534.01	1342045.06	384.81	Measured

GN22	12°07'49.6038"N	61°44'51.0545"W	26.42				636288.42	1341291.18	427469.32	1340856.68	62.87	Measured
GN23	12°08'00.6583"N	61°37'10.9397"W	-29.97				650196.59	1341697.99	441374.17	1341212.34	6.32	Measured
GN24	12°07'12.0947"N	61°41'08.5961"W	254.32				643019.11	1340170.42	434193.64	1339711.62	290.49	Measured
GN25	12°06'47.5005"N	61°39'04.2378"W	174.69				646782.53	1339433.13	437953.04	1338960.80	210.90	Measured
GN26	12°05'35.3328"N	61°44'56.2752"W	-33.17				636149.49	1337165.23	427315.33	1336732.59	3.10	Measured
GN27	12°05'20.7972"N	61°38'42.9210"W	170.16				647440.22	1336772.42	438600.76	1336298.65	206.44	Measured
GN28	12°05'20.4718"N	61°43'13.6666"W	159.73				639254.00	1336723.01	430417.20	1336279.17	195.90	Measured
GN29	12°04'36.0850"N	61°43'36.1252"W	87.84				638581.30	1335356.13	429739.72	1334915.20	124.01	Measured
GN30	12°03'39.4918"N	61°38'38.0951"W	55.41				647601.55	1333660.62	438750.68	1333187.37	91.81	Measured
GN31	12°02'58.4768"N	61°45'01.0024"W	-35.25				636028.55	1332345.49	427176.84	1331914.87	0.895*	Measured
GN32	12°02'49.0498"N	61°44'40.0055"W	-25.87				636664.82	1332058.77	427811.86	1331625.92	10.258*	Measured
GN33	12°02'55.7131"N	61°43'08.5655"W	190.52				639429.03	1332276.26	430575.94	1331833.27	226.67	Measured
GN34	12°01'54.3498"N	61°40'18.1728"W	-28.82				644590.89	1330415.44	435729.26	1329954.30	7.55	Measured
GN35	12°01'07.6535"N	61°41'46.3584"W	-1.69				641930.75	1328968.00	433064.77	1328517.03	34.61	Measured
GN36	12°00'30.3151"N	61°47'07.7745"W	-9.76				632215.14	1327776.38	423348.04	1327361.09	26.34	Measured
GN37	12°00'19.7064"N	61°45'55.5202"W	-34.23				634401.86	1327460.17	425532.91	1327037.04	1.970*	Measured
GN38	11°59'16.2644"N	61°45'40.9715"W	-11.54				634850.64	1325513.03	425974.48	1325088.91	24.59	Measured
GN39	12°12'58.8415"N	61°37'15.9862"W	215.85				649997.51	1350858.80	441208.89	1350370.54	252.27	Measured
GN40	12°11'47.1119"N	61°36'48.9582"W	-9.36				650825.64	1348659.09	442028.60	1348168.58	26.98	Measured
GN41	12°07'56.9748"N	61°39'06.2451"W	148.99				646711.29	1341567.37	437889.64	1341094.55	185.18	Measured
Trig Points												
GS1	12°03'20.5812"N	61°45'03.9106"W	86.18	2952682.643	-5495459.516	1323448.774			427088.31	1332593.69		Transformed
GS2	12°03'47.1970"N	61°43'00.1879"W	485.32	2956082.405	-5493880.685	1324332.014			430827.57	1333414.78		Transformed
GS3	12°04'54.7016"N	61°45'24.6493"W	113.95	2951856.780	-5495247.559	1326282.883			426458.82	1335483.89		Transformed
GS4	12°06'38.3976"N	61°38'29.3837"W	142.84				647837.69	1339158.67	439006.82	1338682.58	179.09	Measured
GS5	12°09'12.2889"N	61°43'56.5623"W	98.23				637923.93	1343839.15	429113.65	1343397.81	134.71	Measured
GS6	12°09'45.1326"N	61°38'28.4482"W	240.53	2962107.634	-5487739.754	1335035.269			439027.54	1344417.98		Transformed
GS7	12°13'37.4127"N	61°35'42.1828"W	-27.11				652826.33	1352058.48	444041.10	1351559.33	9.30	Measured

GS8	12°02'35.9564"N	61°45'07.0405"W	12.70				635849.11	1331652.77	426994.93	1331223.02	48.841	Measured
GS9	12°01'51.8199"N	61°43'54.4630"W	142.14	2954828.200	-5495014.503	1320792.932			429190.35	1329869.50		Transformed
GS10	12°05'38.3756"N	61°41'41.7685"W	511.95	2957844.246	-5492149.892	1327678.579			433194.29	1336832.02		Transformed
GS14	12°01'47.9671"N	61°43'54.4069"W	136.39	2954838.716	-5495030.477	1320675.940			429192.16	1329751.17		Transformed
GS15	12°02'53.4299"N	61°44'14.2836"W	193.29				637442.03	1332196.90	428589.32	1331761.18	229.44	Measured
HOGIS LAND	12°00'09.9901"N	61°44'15.2044"W	13.60	2954524.575	-5495774.686	1317705.630			428566.27	1326741.36		Transformed
GT1	12°00'30.2928"N	61°47'26.9111"W	-1.04	2949347.308	-5498391.334	1318312.811			422769.44	1327359.96		Transformed
GT2	12°00'55.3748"N	61°46'45.3947"W	-3.27				632888.58	1328549.27	424024.07	1328131.29	32.84	Measured
GT3	12°01'26.2897"N	61°46'30.7000"W	-25.69	2950664.794	-5497250.500	1319990.669			424467.57	1329081.15		Transformed
GT4	12°01'50.6517"N	61°45'16.5479"W	-35.54	2952562.478	-5496043.474	1320720.788			426708.76	1329831.31		Transformed
GT5	12°02'04.4221"N	61°45'19.0334"W	-35.83	2952454.373	-5496001.097	1321134.570			426633.24	1330254.17		Transformed
GT6	12°02'24.1760"N	61°45'15.4971"W	-29.10	2952491.802	-5495844.755	1321729.631			426739.61	1330860.98		Transformed
GT7	12°02'56.5513"N	61°45'15.3054"W	17.57				635596.30	1332284.37	426744.51	1331855.34	53.73	Measured
GT8	12°04'03.1688"N	61°44'59.1700"W	55.14	2952665.139	-5495124.021	1324722.066			427230.42	1333901.83		Transformed
GT9	12°04'56.3415"N	61°44'40.4804"W	218.29	2953076.756	-5494695.913	1326354.001			427793.86	1335535.47		Transformed
GT10	12°04'47.5590"N	61°43'19.1620"W	167.54	2955246.017	-5493537.291	1326079.472			430252.12	1335268.13		Transformed
GT11	12°03'19.3499"N	61°42'46.0621"W	336.20	2956474.262	-5493707.257	1323463.990			431255.47	1332559.94		Transformed
GT12	12°03'23.3661"N	61°42'39.8166"W	352.51	2956635.945	-5493609.078	1323588.091			431444.14	1332683.49		Transformed
GT12A	12°03'36.8767"N	61°42'26.9111"W	374.69	2956948.831	-5493366.803	1323998.750			431833.82	1333098.87		Transformed
GT13	12°03'47.4714"N	61°42'25.0737"W	397.91	2956976.285	-5493300.552	1324321.993			431889.02	1333424.32		Transformed
GT14	12°03'47.7945"N	61°42'19.5654"W	420.11	2957132.288	-5493238.876	1324336.345			432055.52	1333434.43		Transformed
GT15	12°03'37.7206"N	61°41'49.0428"W	363.68				641827.68	1333578.20	432978.53	1333126.03	399.86	Measured
GT16	12°03'23.6441"N	61°41'50.8182"W	294.57	2957913.161	-5492855.112	1323584.343			432925.33	1332693.63		Transformed
GT17	12°03'17.0846"N	61°41'24.3648"W	262.30	2958622.594	-5492484.993	1323380.478			433725.24	1332493.06		Transformed
GT18	12°03'42.2787"N	61°41'07.0235"W	316.25	2959032.668	-5492140.301	1324148.881			434248.58	1333267.46		Transformed
GT19	12°03'13.7245"N	61°40'46.7933"W	198.12	2959603.466	-5491909.718	1323266.096			434861.14	1332391.16		Transformed
GT20	12°01'33.6573"N	61°40'31.7107"W	37.51	2960234.847	-5492119.645	1320225.266			435320.72	1329318.27		Transformed
GT21	12°00'39.9349"N	61°40'59.2399"W	-28.71				643359.86	1328123.17	434490.33	1327667.30	7.69	Measured
GT22	12°01'41.1413"N	61°41'36.3087"W	46.76	2958496.240	-5493012.231	1320452.116			433367.47	1329545.89		Transformed

GT23	12°01'01.1089"N	61°41'49.8433"W	4.51	2958237.694	-5493395.567	1319240.160			432959.63	1328315.91		Transformed
GT24	12°00'38.6582"N	61°42'05.5402"W	9.75	2957890.139	-5493751.628	1318566.485			432485.80	1327625.85		Transformed
GT25	12°01'02.0695"N	61°43'06.5405"W	-6.55	2956186.799	-5494480.241	1319266.727			430640.73	1328342.94		Transformed
GT26	12°00'22.5546"N	61°43'36.0710"W	20.03	2955532.147	-5495148.862	1318084.612			429749.11	1327128.41		Transformed
GT27	12°00'10.0112"N	61°44'15.2190"W	13.91				637436.80	1327176.05	428565.83	1326742.01	50.07	Measured
GT28	12°04'47.5191"N	61°42'33.0712"W	401.51	2956582.056	-5493078.483	1326127.240			431645.31	1335268.35		Transformed
GT29	12°01'06.3244"N	61°44'23.1246"W	20.43	2954146.151	-5495576.727	1319400.225			428325.17	1328471.35		Transformed
G1	12°00'19.9885"N	61°46'19.6087"W	-6.89	2951169.673	-5497481.688	1318001.884			424804.58	1327045.10		Transformed
G2	12°00'57.8173"N	61°45'26.1555"W	-19.50	2952473.936	-5496492.748	1319136.230			426419.73	1328208.32		Transformed
G3	12°00'46.8015"N	61°45'19.6647"W	44.64				635482.53	1328297.49	426616.27	1327870.17	80.76	Measured
G4	12°00'19.5213"N	61°46'00.0419"W	-2.76	2951694.491	-5497207.897	1317988.702			425396.20	1327031.24		Transformed
G5	12°00'58.6161"N	61°45'58.5449"W	69.27				634305.02	1328655.17	425440.45	1328232.01	105.38	Measured
GCA80	12°27'04.2669"N	61°28'15.7458 W	58.64				666177.22	1376923.77	457479.51	1376365.14	95.01	Measured
GL61	12°30'59.7860"N	61°23'04.8499"W	188.13				675521.47	1384216.44	466847.35	1383619.49	224.41	Measured
GL63	12°31'02.9562"N	61°23'35.3088"W	12.43				674601.30	1384308.25	465927.92	1383714.74	48.67	Measured
G6	11°59'16.4906"N	61°45'40.5406"W	-12.28	2952400.283	-5497275.268	1316092.194			425987.51	1325095.87		Transformed
G7	11°59'15.1582"N	61°47'11.1351"W	-28.05	2949982.244	-5498565.376	1316048.869			423248.22	1325052.70		Transformed
G8	12°00'10.7509"N	61°48'06.4713"W	1.10	2948352.710	-5499068.827	1317725.898			421573.78	1326758.88		Transformed
G9	11°59'41.6766"N	61°42'37.6878"W	-15.98	2957194.512	-5494511.042	1316848.461			431515.66	1325874.71		Transformed
G10	12°02'43.7541"N	61°44'14.6012"W	184.06	2954153.499	-5495045.905	1322362.479			428580.00	1331463.99		Transformed
G11	12°04'16.1484"N	61°44'38.7890"W	296.64				636689.35	1334734.87	427846.14	1334301.05	332.82	Measured
G12	12°04'26.5439"N	61°41'39.7933"W	666.64	2958187.695	-5492661.619	1325552.386			433256.46	1334625.88		Transformed
G13	12°02'25.3124"N	61°40'08.5311"W	105.76				644877.87	1331368.14	436019.61	1330905.62	142.12	Measured
G14	12°02'26.2869"N	61°38'22.2569"W	-18.18				648091.64	1331413.83	439232.41	1330939.60	18.36	Measured
G15	12°04'59.0905"N	61°40'21.3888"W	679.56	2960182.011	-5491363.655	1326533.163			435625.26	1335628.24		Transformed
G16	12°04'51.6144"N	61°37'21.2836"W	45.48				649913.17	1335888.13	441069.59	1335405.63	81.91	Measured
G17	12°07'30.3206"N	61°36'23.4650"W	0.70	2965735.225	-5486504.289	1330934.839			442810.26	1340282.58		Transformed
G18	12°07'55.3595"N	61°39'09.4558"W	156.08	2961314.393	-5488880.592	1331719.733			437792.68	1341044.81		Transformed
G19	12°07'06.2972"N	61°41'53.3777"W	728.55	2957366.870	-5492003.897	1330365.892			432840.42	1339532.03		Transformed

G20	12°07'42.8071"N	61°44'38.7282"W	99.46	2952560.574	-5493623.555	1331330.722			427842.03	1340648.27		Transformed
G21	12°08'02.4563"N	61°42'31.6108"W	646.46	2956138.958	-5492162.066	1332036.021			431683.07	1341255.63		Transformed
G22	12°09'45.0394"N	61°40'29.6105"W	804.19	2959145.288	-5489964.352	1335151.225			435366.28	1344410.52		Transformed
G23	12°10'23.6231"N	61°36'18.8499"W	-4.01	2965322.823	-5485447.956	1336139.943			442942.02	1345605.61		Transformed
G24	12°12'58.6517"N	61°37'22.3929"W	222.24	2963259.638	-5485670.388	1340844.169			441015.33	1350364.44		Transformed
G25	12°12'04.5717"N	61°40'43.9066"W	342.88				643721.88	1349160.07	434929.21	1348695.58	379.36	Measured
G26	12°10'47.9897"N	61°42'56.2525"W	160.79				639733.10	1346787.97	430933.06	1346338.99	197.33	Measured
GT30	12°00'34.6851"N	61°47'05.1728"W	10.11				632293.23	1327910.98	423426.59	1327495.37	46.21	Measured
GT31	12°00'12.1978"N	61°47'09.4057"W	-8.18	2949865.315	-5498236.772	1317767.458			423299.15	1326804.61		Transformed
GT32	12°00'42.3101"N	61°46'06.0358"W	38.20	2951484.775	-5497200.601	1318682.164			425214.39	1327731.01		Transformed
GT33	11°59'42.4961"N	61°46'00.8613"W	-24.28	2951774.599	-5497409.490	1316871.369			425372.39	1325894.06		Transformed
GT34	12°00'26.5822"N	61°45'23.0578"W	23.60	2952670.959	-5496661.514	1318206.411			426514.24	1327249.07		Transformed
GT35	11°59'44.9254"N	61°45'19.2921"W	4.41	2952888.385	-5496825.547	1316950.348			426629.23	1325969.76		Transformed
GT36	12°00'11.0589"N	61°44'42.4630"W	35.22	2953805.042	-5496177.699	1317742.250			427742.06	1326773.41		Transformed
GT37	12°00'59.0203"N	61°44'56.0126"W	95.55	2953326.768	-5496153.574	1319196.340			427331.04	1328246.09		Transformed
GT38	12°00'59.6530"N	61°46'31.0555"W	63.78	2950777.319	-5497482.879	1319208.743			424457.49	1328263.04		Transformed
GT39	12°01'06.6467"N	61°46'09.4089"W	73.25	2951337.453	-5497141.910	1319420.912			425111.78	1328478.38		Transformed
GT40	12°01'14.2091"N	61°45'28.3300"W	73.28	2952409.301	-5496511.419	1319648.205			426353.54	1328711.71		Transformed
GT41	12°01'30.4883"N	61°45'05.9150"W	111.70	2952975.061	-5496131.857	1320145.477			427030.78	1329212.31		Transformed
GT42	12°02'08.8548"N	61°45'07.3454"W	70.24	2952801.453	-5495900.149	1321289.904			426986.47	1330390.63		Transformed
GT43	12°02'15.8292"N	61°44'55.5295"W	107.13	2953112.204	-5495723.400	1321507.201			427343.49	1330605.16		Transformed
GT44	12°02'58.2625"N	61°45'01.5693"W	-34.00	2952757.174	-5495448.618	1322752.974			427159.71	1331908.27		Transformed
GT45	12°02'52.3407"N	61°44'28.3997"W	145.55	2953741.986	-5495161.840	1322612.493			428162.61	1331727.32		Transformed
GT46	12°02'33.1432"N	61°44'30.2327"W	101.36	2953730.973	-5495258.453	1322026.336			428107.75	1331137.65		Transformed
GT47	12°01'51.4640"N	61°44'40.3197"W	83.68	2953580.487	-5495622.924	1320770.048			427804.00	1329857.25		Transformed
GT48	12°01'13.5441"N	61°44'55.3816"W	106.22	2953304.531	-5496071.868	1319635.080			427349.71	1328692.18		Transformed
GT49	11°59'50.9692"N	61°43'36.2403"W	-8.62	2955609.962	-5495304.352	1317129.299			429744.96	1326158.31		Transformed
GT50	11°59'59.0141"N	61°43'08.4290"W	-18.35	2956322.022	-5494852.149	1317369.082			430585.61	1326406.24		Transformed
GT51	12°00'51.2519"N	61°43'41.7514"W	63.00	2955313.804	-5495105.660	1318956.079			429576.49	1328009.63		Transformed

GT52	12°00'45.1679"N	61°42'52.4424"W	34.39	2956632.540	-5494408.637	1318767.265			431067.51	1327824.28		Transformed
GT53	12°00'40.4639"N	61°43'15.8593"W	37.42	2956024.405	-5494773.366	1318626.514			430359.66	1327679.08		Transformed
GT54	12°01'20.9599"N	61°43'17.5886"W	66.67	2955869.153	-5494595.185	1319849.725			430306.12	1328922.79		Transformed
GT55	12°01'02.5886"N	61°42'49.8273"W	18.84	2956642.189	-5494259.634	1319287.617			431146.02	1328359.41		Transformed
GT56	12°00'44.0357"N	61°42'29.5875"W	2.71	2957230.067	-5494060.087	1318726.642			431758.56	1327790.23		Transformed
GT57	12°01'12.1951"N	61°41'45.2370"W	54.86	2958350.089	-5493310.409	1319583.839			433098.52	1328656.55		Transformed
GT58	12°01'06.5700"N	61°41'08.8406"W	10.69	2959315.946	-5492781.967	1319405.578			434199.12	1328485.02		Transformed
GT59	12°00'53.4911"N	61°41'41.0544"W	-17.37	2958484.723	-5493293.577	1319006.650			433225.62	1328082.23		Transformed
GT60	12°02'09.2409"N	61°43'37.2494"W	137.37	2955231.695	-5494665.487	1321315.505			429710.23	1330405.07		Transformed
GT61	12°02'23.2224"N	61°43'05.4388"W	170.01	2956051.727	-5494158.860	1321742.506			430671.49	1330835.47		Transformed
GT62	12°02'34.1136"N	61°42'35.7352"W	305.05	2956872.400	-5493787.931	1322097.999			431569.12	1331170.91		Transformed
GT63	12°01'55.6890"N	61°42'55.7106"W	166.05	2956392.616	-5494171.398	1320914.198			430966.46	1329990.12		Transformed
GT64	12°01'36.2125"N	61°42'31.2315"W	104.81	2957075.362	-5493877.591	1320316.082			431707.15	1329392.71		Transformed
GT65	12°01'51.0649"N	61°42'07.0067"W	107.87	2957676.903	-5493449.151	1320763.098			432439.05	1329849.66		Transformed
GT66	12°01'50.3392"N	61°41'46.5298"W	88.38	2958215.415	-5493142.809	1320737.226			433058.14	1329828.05		Transformed
GT67	12°01'50.1253"N	61°41'01.9137"W	58.55	2959390.349	-5492478.322	1320724.577			434407.01	1329823.00		Transformed
GT68	12°02'01.0713"N	61°40'37.1726"W	64.66	2960018.712	-5492066.849	1321054.822			435154.61	1330160.06		Transformed
GT69	12°01'45.1990"N	61°40'10.6103"W	42.13	2960763.732	-5491755.712	1320573.100			435958.23	1329673.52		Transformed
GT71	12°03'00.2223"N	61°39'35.4829"W	9.26	2961455.417	-5490799.879	1322820.898			437017.38	1331979.05		Transformed
GT72	12°02'27.6518"N	61°39'31.4255"W	-11.49	2961652.944	-5490907.591	1321837.762			437141.28	1330978.85		Transformed
GT73	12°01'35.9836"N	61°39'36.5348"W	-23.83	2961668.331	-5491261.667	1320282.396			436988.78	1329391.74		Transformed
GT74	12°01'56.4492"N	61°39'30.3766"W	-17.61	2961772.943	-5491063.240	1320898.758			437174.18	1330020.54		Transformed
GT75	12°03'09.0795"N	61°40'12.3806"W	174.88				644754.94	1332712.27	435901.61	1332249.73	211.18	Measured
GT76	12°03'08.3031"N	61°40'29.7697"W	31.65	2959995.983	-5491552.751	1323068.412			435375.97	1332225.25		Transformed
GT77	12°02'58.3169"N	61°40'43.5261"W	24.17	2959656.651	-5491800.112	1322766.751			434960.47	1331918.05		Transformed
GT78	12°02'40.2430"N	61°40'57.4771"W	9.75	2959333.494	-5492089.903	1322220.587			434539.36	1331362.45		Transformed
GT79	12°02'49.2618"N	61°41'29.3316"W	30.24	2958467.363	-5492513.583	1322495.895			433576.06	1331638.35		Transformed
GT80	12°02'50.2852"N	61°42'03.1770"W	41.30	2957568.092	-5493002.707	1322528.961			432552.85	1331668.65		Transformed
GT81	12°02'13.0047"N	61°41'21.1597"W	6.47	2958784.178	-5492580.544	1321401.323			433824.36	1330525.04		Transformed

GT82	12°03'10.6403"N	61°43'14.4912"W	58.41	2955614.818	-5493924.665	1323144.235			430396.34	1332291.55		Transformed
GT83	12°03'17.0653"N	61°43'48.6368"W	473.24	2954877.915	-5494734.858	1323423.953			429363.92	1332487.86		Transformed
GT84	12°03'43.0829"N	61°43'41.4881"W	43.69	2954790.267	-5494115.381	1324116.089			429579.23	1333287.16		Transformed
GT85	12°03'31.0836"N	61°44'17.6374"W	-12.76	2953837.683	-5494652.380	1323743.713			428486.83	1332917.56		Transformed
GT86	12°03'52.5310"N	61°44'46.4602"W	32.03	2953025.385	-5494982.354	1324397.569			427614.92	1333575.46		Transformed
GT87	12°04'08.1440"N	61°44'08.9042"W	8.22	2953967.327	-5494335.742	1324861.758			428749.73	1334056.06		Transformed
GT88	12°03'47.4153"N	61°45'18.5273"W	2.86	2952173.120	-5495445.201	1324237.748			426645.72	1333417.46		Transformed
GT89	12°04'31.1842"N	61°45'10.6238"W	-35.45	2952232.863	-5495051.343	1325544.959			426883.42	1334761.97		Transformed
GT90	12°05'00.5385"N	61°44'31.8471"W	336.11				636892.99	1336099.63	428054.69	1335664.62	372.33	Measured
GT91	12°05'40.2890"N	61°45'19.3941"W	-22.42	2951794.853	-5494796.449	1327624.112			426616.42	1336884.18		Transformed
GT92	12°05'49.8071"N	61°43'42.3826"W	41.70	2954379.533	-5493408.773	1327923.532			429548.33	1337179.28		Transformed
GT93	12°06'04.2526"N	61°45'01.1420"W	1.61	2952219.144	-5494419.979	1328349.161			427167.42	1337620.68		Transformed
GT94	12°06'53.1373"N	61°44'43.7455"W	5.86	2952535.344	-5493897.079	1329818.797			427691.82	1339122.59		Transformed
GT95	12°06'22.1081"N	61°43'54.8996"W	70.34	2953960.873	-5493429.437	1328900.052			429169.03	1338170.99		Transformed
GT96	12°06'05.3983"N	61°42'58.6902"W	108.60	2955526.529	-5492752.010	1328406.014			430868.44	1337659.49		Transformed
GT97	12°05'25.0227"N	61°42'18.8826"W	142.87	2956725.653	-5492439.938	1327200.030			432072.95	1336420.68		Transformed
GT98	12°04'26.6530"N	61°42'52.1943"W	72.71	2955983.987	-5493187.574	1325431.428			431067.94	1334626.87		Transformed
GT99	12°04'47.0002"N	61°43'48.6291"W	43.77	2954405.557	-5493855.999	1326036.780			429361.43	1335250.07		Transformed
GT100	12°03'18.2609"N	61°38'54.2954"W	-5.31	2962490.043	-5490094.020	1323359.939			438261.79	1332534.65		Transformed
GT110	12°06'12.4800"N	61°37'43.2700"W	26.07	2963862.559	-5488114.843	1328601.486			440401.63	1337888.42		Transformed
GT111	12°03'08.8681"N	61°38'19.0012"W	1.06	2963461.008	-5489645.543	1323079.005			439329.11	1332247.55		Transformed
GT112	12°07'30.8134"N	61°37'22.6021"W	15.96				649848.64	1340779.24	441022.98	1340295.20	52.24	Measured
GT113	12°06'53.0898"N	61°38'04.9913"W	105.29	2963197.036	-5488264.748	1329838.236			439743.44	1339134.81		Transformed
GT114	12°06'37.6593"N	61°39'15.7817"W	264.95	2961434.641	-5489506.353	1329408.125			437604.52	1338658.10		Transformed
GT115	12°05'59.3039"N	61°39'16.6846"W	354.57	2961569.565	-5489813.973	1328274.457			437578.72	1337480.03		Transformed
GT116	12°05'21.6132"N	61°37'19.9002"W	5.67	2964630.547	-5488049.644	1327068.846			441110.13	1336327.07		Transformed
GT117	12°07'29.4599"N	61°36'22.3330"W	3.26	2965769.169	-5486495.101	1330909.520			442844.51	1340256.20		Transformed
GT118	12°08'44.7401"N	61°37'11.5052"W	60.52	2964256.599	-5486823.363	1333183.138			441355.19	1342566.24		Transformed
GT119	12°09'37.0560"N	61°38'53.5752"W	397.85	2961536.962	-5488281.912	1334825.784			438268.57	1344168.92		Transformed

GT120	12°09'01.6294"N	61°38'22.9013"W	112.01				648011.72	1343560.35	439196.93	1343082.05	148.24	Measured
GT122	12°09'13.0655"N	61°37'44.4137"W	74.21	2963300.476	-5487146.810	1334036.937			440359.52	1343434.86		Transformed
GT121	12°08'09.6726"N	61°38'44.9550"W	195.78	2961940.883	-5488481.598	1332158.088			438532.55	1341485.38		Transformed
GT123	12°08'21.3129"N	61°38'03.5595"W	60.48	2962943.738	-5487704.479	1332479.342			439783.08	1341844.55		Transformed
GT124	12°03'40.0606"N	61°40'22.6379"W	420.67	2960269.648	-5491605.850	1324104.042			435590.40	1333200.90		Transformed
GT125	12°07'35.7967"N	61°38'05.9814"W	38.54	2963008.772	-5487979.068	1331107.308			439711.76	1340446.47		Transformed
GT126	12°09'01.4986"N	61°39'38.9174"W	389.36				645713.81	1343544.94	436899.78	1343075.08	425.57	Measured
GT127	12°07'27.0816"N	61°38'48.3309"W	89.10	2961932.132	-5488680.318	1330856.096			438432.22	1340177.11		Transformed
GT128	12°09'29.2278"N	61°36'59.4588"W	3.83	2964413.895	-5486348.301	1334507.633			441717.31	1343933.15		Transformed
GT129	12°10'26.8469"N	61°36'58.6518"W	47.41	2964278.230	-5486045.898	1336247.624			441739.19	1345702.90		Transformed
GT130	12°08'09.9732"N	61°40'29.6331"W	274.03	2959190.510	-5490049.689	1332183.570			435369.08	1341490.67		Transformed
GT131	12°07'33.7416"N	61°40'34.5525"W	209.41	2959140.609	-5490270.620	1331081.461			435221.73	1340377.68		Transformed
GT132	12°08'17.6735"N	61°39'31.7860"W	255.18	2960697.714	-5489159.556	1332410.946			437116.97	1341729.31		Transformed
GT133	12°09'59.7428"N	61°38'15.2714"W	246.39	2962415.978	-5487472.308	1335475.395			439425.12	1344867.25		Transformed
GT134	12°04'51.5283"N	61°37'21.1913"W	45.90	2964706.884	-5488273.111	1326173.289			441072.38	1335402.99		Transformed
GT135	12°06'56.1562"N	61°37'29.7028"W	-20.26	2964068.210	-5487632.306	1329904.018			440809.85	1339230.44		Transformed
GT136	12°09'00.1405"N	61°40'25.6975"W	613.88	2959299.033	-5490000.222	1333762.248			435486.17	1343031.64		Transformed
GT137	12°09'56.3489"N	61°39'41.9409"W	640.60				645614.12	1345229.72	436806.32	1344759.63	676.85	Measured
GT138	12°10'42.2097"N	61°37'26.3290"W	118.71	2963527.871	-5486417.318	1336724.127			440902.23	1346173.59		Transformed
GT139	12°11'21.5367"N	61°38'01.0806"W	193.05	2962516.822	-5486756.048	1337921.099			439850.54	1347380.04		Transformed
GT140	12°11'44.8964"N	61°37'05.5778"W	45.57	2963852.531	-5485698.471	1338591.589			441526.54	1348099.83		Transformed
GT141	12°11'56.1846"N	61°36'48.1685"W	11.75	2964264.970	-5485354.737	1338923.488			442052.06	1348447.28		Transformed
GT142	12°11'04.4468"N	61°36'59.9965"W	60.82	2964132.820	-5485862.295	1337379.854			441696.93	1346857.69		Transformed
GT143	12°11'06.2464"N	61°36'28.5551"W	30.36	2964949.301	-5485373.947	1337427.480			442646.87	1346914.32		Transformed
GT144	12°12'25.0512"N	61°37'03.4652"W	54.10	2963788.715	-5485446.013	1339799.438			441588.63	1349333.23		Transformed
GT145	12°07'11.3245"N	61°39'24.1800"W	221.66	2961087.951	-5489398.581	1330410.525			437349.39	1339691.77		Transformed
GT146	12°04'29.1110"N	61°43'51.1088"W	81.57	2954411.490	-5494025.365	1325507.141			429287.02	1334700.56		Transformed
GT147	12°04'48.8575"N	61°43'00.8976"W	236.44	2955760.418	-5493327.570	1326132.911			430804.16	1335308.57		Transformed
GT148	12°05'00.4351"N	61°42'05.1335"W	437.96	2957303.556	-5492636.206	1326522.993			432489.35	1335665.95		Transformed

GT149	12°05'19.5492"N	61°41'54.1992"W	548.30	2957587.565	-5492466.142	1327120.470			432819.21	1336253.38		Transformed
GT150	12°05'38.5805"N	61°41'39.1374"W	512.47				642109.50	1337292.88	433273.81	1336838.41	548.63	Measured
GT151	12°05'44.4810"N	61°41'22.4062"W	473.95	2958323.524	-5491804.894	1327854.079			433779.32	1337020.20		Transformed
GT152	12°06'07.8204"N	61°41'01.4574"W	405.39	2958778.162	-5491313.045	1328541.012			434411.67	1337737.77		Transformed
GT153	12°06'41.9024"N	61°40'38.5614"W	248.12	2959210.528	-5490655.849	1329532.083			435102.46	1338785.36		Transformed
GT154	12°07'23.6278"N	61°44'41.4938"W	68.40	2952531.148	-5493745.445	1330747.984			427759.00	1340059.13		Transformed
GT155	12°07'47.4847"N	61°44'52.6952"W	28.92				636239.11	1341225.84	427419.79	1340791.55	65.36	Measured
GT156	12°07'23.8650"N	61°39'46.5327"W	174.71	2960432.853	-5489607.805	1330777.435			436673.36	1340076.09		Transformed
GT157	12°12'47.4064"N	61°38'37.8438"W	53.37				647525.36	1350494.96	438736.28	1350015.97	89.80	Measured
GT158	12°12'17.6004"N	61°38'58.2082"W	223.48	2960838.360	-5487282.186	1339611.467			438122.21	1349099.70		Transformed
GT159	12°11'44.9323"N	61°39'31.1152"W	278.63	2960089.197	-5487988.643	1338641.902			437129.25	1348095.07		Transformed
GT160	12°13'05.4749"N	61°38'53.4038"W	82.66	2960753.034	-5486818.240	1341019.559			438265.45	1350570.31		Transformed
GT161	12°13'33.3028"N	61°38'26.2824"W	-4.18	2961348.153	-5486194.889	1341836.917			439083.70	1351426.10		Transformed
GT162	12°12'29.4122"N	61°38'28.5042"W	87.87	2961529.134	-5486671.566	1339937.558			439019.18	1349463.66		Transformed
GT163	12°12'15.4894"N	61°36'29.2090"W	-2.26	2964703.035	-5484959.903	1339500.342			442624.04	1349041.03		Transformed
GT164	12°13'18.6048"N	61°36'23.8734"W	9.63	2964655.339	-5484532.496	1341398.428			442782.43	1350979.80		Transformed
GT165	12°12'09.0978"N	61°37'55.6109"W	107.71	2962475.982	-5486332.407	1339331.617			440013.82	1348841.06		Transformed
GT167	12°13'32.5300"N	61°37'30.5342"W	61.09	2962863.531	-5485454.862	1341827.531			440767.93	1351404.65		Transformed
GT168	12°13'43.1668"N	61°37'03.0293"W	28.80	2963547.071	-5484971.056	1342140.136			441598.41	1351732.51		Transformed
GT169	12°08'21.3086"N	61°44'36.0670"W	44.93	2952488.480	-5493319.450	1332475.942			427921.34	1341830.87		Transformed
GT170	12°08'58.7970"N	61°44'09.0857"W	-19.36	2953062.504	-5492664.373	1333588.610			428735.61	1342983.06		Transformed
GT171	12°09'55.0751"N	61°43'55.4683"W	-33.99	2953245.863	-5492136.045	1335276.092			429145.41	1344711.97		Transformed
GT172	12°11'00.6506"N	61°43'26.3076"W	-0.44	2953836.511	-5491373.108	1337252.900			430024.53	1346726.92		Transformed
GT173	12°11'26.7199"N	61°43'02.6378"W	-34.56	2954370.718	-5490855.813	1338028.721			430738.88	1347528.34		Transformed
GT174	12°12'31.4961"N	61°41'50.3950"W	-35.12	2956093.978	-5489449.901	1339974.137			432919.45	1349520.22		Transformed
GT175	12°13'02.8413"N	61°41'18.5284"W	-33.27	2956846.249	-5488815.340	1340915.927			433881.11	1350484.05		Transformed
GT176	12°13'39.1850"N	61°40'16.4167"W	-0.01				644538.45	1352071.05	435756.25	1351602.53	36.64	Measured
GT177	12°07'21.6260"N	61°43'43.1597"W	455.55	2954270.124	-5493254.950	1330769.147			429522.04	1339999.35		Transformed
GT178	12°08'15.6269"N	61°44'06.4818"W	179.68	2953356.139	-5493044.270	1332333.584			428815.59	1341657.22		Transformed

GT179	12°08'09.3289"N	61°43'23.7153"W	355.89	2954595.879	-5492619.357	1332181.420			430108.21	1341465.07		Transformed
GT180	12°08'34.1731"N	61°43'28.1114"W	176.66	2954319.755	-5492386.622	1332890.122			429974.58	1342227.99		Transformed
GT181	12°09'53.7061"N	61°43'38.9189"W	66.91	2953737.427	-5491993.754	1335256.233			429645.53	1344670.42		Transformed
GT182	12°10'19.7590"N	61°42'58.7077"W	176.98	2954779.049	-5491363.958	1336062.033			430859.78	1345471.84		Transformed
GT183	12°09'50.7624"N	61°42'54.3300"W	76.70	2954938.146	-5491380.319	1335169.869			430992.99	1344581.39		Transformed
GT184	12°09'02.5505"N	61°42'28.4180"W	337.33	2955896.619	-5491508.147	1333776.444			431777.58	1343101.45		Transformed
GT185	12°09'54.8720"N	61°42'04.9484"W	270.59	2956329.985	-5490816.178	1335334.176			432485.04	1344709.21		Transformed
GT186	12°10'10.8101"N	61°42'07.9041"W	303.20	2956217.476	-5490795.714	1335819.829			432395.19	1345198.63		Transformed
GT187	12°10'40.6702"N	61°40'58.4001"W	352.63	2957998.645	-5489671.448	1336727.230			434494.32	1346118.13		Transformed
GT188	12°11'42.5284"N	61°42'28.1538"W	-34.54	2955240.040	-5490271.495	1338503.542			431780.28	1348014.99		Transformed
GT189	12°08'28.4531"N	61°41'37.1124"W	492.82	2957439.089	-5491100.678	1332784.777			433329.16	1342055.89		Transformed
GT190	12°07'52.3754"N	61°41'20.0420"W	354.16	2957939.772	-5490941.758	1331671.708			433846.30	1340948.40		Transformed
GT191	12°13'08.7089"N	61°40'09.7949"W	156.06	2958744.825	-5487959.020	1341132.221			435957.44	1350666.73		Transformed
GT192	12°12'28.7446"N	61°39'52.3849"W	134.74	2959321.457	-5487919.604	1339927.421			436484.94	1349439.91		Transformed
GT193	12°12'40.3875"N	61°40'41.4031"W	138.06	2957982.823	-5488558.965	1340277.808			435003.54	1349795.72		Transformed
GT194	12°11'20.8846"N	61°39'15.9976"W	260.97	2960557.318	-5487893.842	1337915.849			437586.95	1347357.04		Transformed
GT195	12°11'45.9450"N	61°38'40.1627"W	139.07	2961376.866	-5487131.434	1338642.835			438668.69	1348128.15		Transformed
GT196	12°10'35.7746"N	61°39'18.3701"W	371.61	2960684.437	-5488280.548	1336584.172			437517.03	1345971.44		Transformed
GT197	12°10'19.8923"N	61°38'52.4656"W	215.27	2961349.982	-5487864.766	1336074.113			438300.40	1345484.64		Transformed
GT198	12°07'33.7429"N	61°40'34.5509"W	209.41	2959140.649	-5490270.589	1331081.500			435221.78	1340377.72		Transformed
GT199	12°10'58.2155"N	61°38'24.2143"W	200.78				647954.10	1347142.20	439152.51	1346662.82	237.08	Measured
GT200	12°08'46.5567"N	61°36'31.6771"W	-33.94	2965266.512	-5486159.319	1333217.836			442558.71	1342623.74		Transformed
GT201	12°08'29.2429"N	61°37'25.8500"W	-15.39	2963887.351	-5487052.350	1332701.615			440922.35	1342089.66		Transformed
GT202	12°12'07.0566"N	61°40'13.6945"W	124.06	2958816.378	-5488340.140	1339273.765			435841.93	1348773.00		Transformed
GT203	12°09'35.6497"N	61°43'39.4387"W	76.36	2953783.334	-5492112.287	1334715.822			429630.38	1344115.82		Transformed
OM01	12°31'28.1085"N	61°26'21.1543"W	23.23				669589.82	1385051.11	460921.37	1384476.25	59.48	Measured
OM02	12°30'17.4042"N	61°25'52.4124"W	-19.49				670470.41	1382883.67	461793.39	1382306.38	16.78	Measured
OM03	12°29'54.3606"N	61°26'54.8699"W	-7.54				668588.88	1382164.48	459909.93	1381594.60	28.77	Measured
OM04	12°29'14.5753"N	61°25'37.2015"W	-16				670941.12	1380955.80	462256.63	1380377.55	20.29	Measured

OM05	12°28'57.2950"N	61°27'25.1233"W	-33.98				667685.68	1380405.66	459000.47	1379839.92	2.35	Measured
OM06	12°28'27.9546"N	61°28'29.5586"W	-31.46				665745.33	1379492.85	457057.48	1378934.80	4.95	Measured
OM07	12°28'41.6544"N	61°26'02.2456"W	-23.63				670190.93	1379939.74	461502.92	1379364.74	12.68	Measured
OM08	12°28'10.3700"N	61°29'16.6459"W	18.34				664326.64	1378944.39	455637.29	1378391.91	54.82	Measured
OM09	12°27'55.9859"N	61°27'33.2935"W	-8.13				667449.94	1378520.36	458757.72	1377956.28	28.21	Measured
OM10	12°27'31.4936"N	61°28'50.5163"W	-32.81				665122.46	1377754.34	456428.30	1377199.34	3.62	Measured
OM12	12°12'35.7936"N	61°37'15.8000"W	54.76				650006.75	1350150.69	441215.50	1349662.66	91.16	Measured
OM13	12°13'18.3930"N	61°38'25.5861"W	16.05				647891.03	1351448.87	439105.35	1350968.18	52.55	Measured
OM14	12°12'27.1141"N	61°39'52.7687"W	134.26				645264.03	1349860.24	436473.41	1349389.82	170.73	Measured
OM15	12°12'49.3028"N	61°41'21.0001"W	-13.71				642594.14	1350528.95	433806.91	1350068.14	22.95	Measured
OM16	12°11'25.4509"N	61°38'33.7536"W	85.81				647661.58	1347977.54	438863.17	1347498.95	122.17	Measured
OM17	12°11'32.2064"N	61°42'14.1889"W	-20.59				640998.01	1348152.52	432202.56	1347698.42	15.98	Measured
OM18	12°10'22.4244"N	61°37'06.0555"W	15.25				650322.13	1346054.45	441515.67	1345566.75	51.55	Measured
OM19	12°09'36.6911"N	61°43'54.4121"W	-34.16				637985.43	1344589.17	429177.89	1344147.36	2.38	Measured
OM20	12°09'22.5989"N	61°37'24.3765"W	29.46				649777.64	1344213.53	440964.61	1343728.50	65.73	Measured
OM21	12°08'28.8591"N	61°42'03.9696"W	353.44				641333.79	1342520.88	432517.52	1342067.46	389.71	Measured
OM22	12°07'48.3079"N	61°44'50.0038"W	30.7				636320.36	1341251.51	427501.11	1340816.91	67.15	Measured
OM23	12°07'56.3188"N	61°37'11.5199"W	-30.47				650179.72	1341564.57	441356.82	1341079.04	5.82	Measured
OM24	12°07'09.8898"N	61°41'08.2265"W	257.1				643030.61	1340102.73	434204.89	1339643.91	293.28	Measured
OM25	12°06'46.3736"N	61°39'05.9874"W	176.52				646729.80	1339398.24	437900.20	1338926.13	212.75	Measured
OM26	12°05'36.6126"N	61°45'00.7948"W	-33.3				636012.66	1337203.93	427178.69	1336771.77	2.99	Measured
OM27	12°05'18.3989"N	61°38'43.0645"W	170.1				647436.24	1336698.72	438596.52	1336224.98	206.40	Measured
OM28	12°05'18.1362"N	61°43'14.7637"W	158.66				639221.16	1336651.10	430384.11	1336207.40	194.85	Measured
OM29	12°04'38.2796"N	61°43'35.1695"W	90.72				638609.88	1335423.69	429768.55	1334982.64	126.91	Measured
OM30	12°03'41.3645"N	61°38'40.4366"W	63.07				647530.46	1333717.81	438679.82	1333244.79	99.48	Measured
OM31	12°02'57.9664"N	61°45'01.8310"W	-33.8				636003.57	1332329.70	427151.81	1331899.17	2.36	Measured
OM32-1	12°02'47.4453"N	61°44'38.8058"W	-20.69				636701.32	1332009.64	427848.17	1331576.67	15.46	Measured
OM32-2	12°02'49.1863"N	61°44'40.2025"W	-25.36				636658.84	1332062.93	427805.90	1331630.11	10.79	Measured
OM33	12°02'57.4203"N	61°43'11.5198"W	191.73				639339.44	1332328.29	430486.58	1331885.61	227.90	Measured

OM34	12°01'50.7046"N	61°40'17.5318"W	-30.67				644610.82	1330303.54	435748.77	1329842.37	5.72	Measured
OM35	12°01'06.1152"N	61°41'44.9952"W	-8.28				641972.20	1328920.93	433106.04	1328469.83	28.03	Measured
OM37	12°00'21.3443"N	61°45'56.6815"W	-33.84				634366.51	1327510.33	425497.76	1327087.32	2.28	Measured
OM40	12°11'50.7464"N	61°36'50.2126"W	-7.92				650787.16	1348770.57	441990.54	1348280.16	28.44	Measured
OM41	12°07'57.8515"N	61°39'08.5903"W	151.41				646640.25	1341593.95	437818.74	1341121.39	187.62	Measured
NGPP Points												
LAS001	12°02'18.2932"N	61°45'12.0059"W	-21.32	2952606.268	-5495834.698	1321554.461			426845.31	1330680.39		Transformed
LAS002	12°02'11.9038"N	61°45'16.9188"W	-20.97	2952494.905	-5495941.395	1321362.516			426696.96	1330484.02		Transformed
LAS003	12°02'04.7461"N	61°45'15.5828"W	-21.89	2952551.783	-5495961.880	1321147.216			426737.55	1330264.22		Transformed
LAS004	12°01'56.8505"N	61°45'07.8584"W	-19.80	2952782.506	-5495897.665	1320910.362			426971.29	1330021.93		Transformed
LAS005	12°01'36.7924"N	61°45'18.0345"W	-29.94	2952567.459	-5496147.763	1320305.433			426664.19	1329405.60		Transformed
LAS006	12°01'28.6146"N	61°45'21.8684"W	-33.64				635410.07	1329581.80	426548.51	1329154.33	2.523*	Measured
LAS007	12°01'22.7207"N	61°45'31.9067"W	-33.89	2952238.611	-5496422.282	1319881.697			426245.18	1328973.04		Transformed
LAS008	12°01'12.8134"N	61°45'34.0723"W	-26.64	2952214.263	-5496515.384	1319585.450			426179.97	1328668.70		Transformed
LAS009	12°00'57.0475"N	61°45'27.6560"W	-20.90	2952435.632	-5496517.358	1319112.802			426374.38	1328184.64		Transformed
LAS010	12°00'59.9993"N	61°45'25.4460"W	-12.77	2952489.353	-5496476.093	1319203.211			426441.12	1328275.36		Transformed
LAS011	12°00'58.0820"N	61°45'23.4100"W	-20.50	2952545.833	-5496451.094	1319143.978			426502.73	1328216.53		Transformed
LAS012	12°00'58.8835"N	61°45'20.7317"W	-16.25	2952616.744	-5496411.901	1319168.953			426583.69	1328241.22		Transformed
LAS013	12°00'35.6243"N	61°45'55.0605"W	-28.34	2951766.712	-5497023.871	1318467.373			425546.40	1327525.95		Transformed
LAS014	12°02'32.5468"N	61°44'52.5571"W	-34.51	2953075.105	-5495464.426	1321980.066			427432.88	1331118.70		Transformed
LAS015	12°02'41.4345"N	61°44'43.1471"W	-34.69	2953298.753	-5495279.347	1322247.119			427717.10	1331391.93		Transformed
LAS016	12°02'48.9498"N	61°44'50.8475"W	-31.46	2953072.278	-5495349.928	1322473.640			427484.10	1331622.54		Transformed
LAS017	12°03'00.4093"N	61°44'58.8857"W	-35.40	2952821.506	-5495396.862	1322817.195			427240.78	1331974.28		Transformed
LAS018	12°03'10.6431"N	61°44'57.6269"W	-29.42	2952826.734	-5495326.156	1323125.981			427278.55	1332288.63		Transformed
LAS019	12°03'18.3490"N	61°45'07.1687"W	44.77	2952583.451	-5495483.100	1323373.045			426989.88	1332525.04		Transformed
LAS020	12°03'30.2479"N	61°45'15.8307"W	-31.55	2952281.203	-5495474.058	1323714.673			426727.71	1332890.26		Transformed
LAS021	12°03'42.5219"N	61°45'20.6804"W	-26.39	2952117.087	-5495478.496	1324084.588			426580.77	1333267.11		Transformed

LAS022	12°03'54.2350"N	61°45'04.9222"W	36.53	2952530.440	-5495240.883	1324449.715			427056.79	1333627.29		Transformed
LAS024	12°03'36.9023"N	61°44'54.0453"W	28.26				636233.55	1333527.00	427386.08	1333095.24	64.43	Measured
LAS025	12°03'26.1332"N	61°44'49.5035"W	-30.92	2952995.405	-5495120.999	1323591.154			427523.68	1332764.61		Transformed
LAS026	12°03'17.3463"N	61°44'18.3661"W	-2.69	2953864.680	-5494749.147	1323333.000			428465.20	1332495.62		Transformed
LAS027	12°03'30.1080"N	61°44'42.6920"W	-28.18	2953166.058	-5495003.365	1323711.173			427729.47	1332886.88		Transformed
LAS028	12°03'31.2369"N	61°44'02.0106"W	25.11	2954271.022	-5494460.325	1323756.228			428959.21	1332922.72		Transformed
LAS029	12°03'16.7245"N	61°43'39.1576"W	98.14	2954957.708	-5494277.912	1323335.371			429650.48	1332477.67		Transformed
LAS030	12°03'14.9705"N	61°43'44.7912"W	116.21	2954821.347	-5494384.093	1323286.436			429480.24	1332423.63		Transformed
LAS031	12°02'50.2327"N	61°43'53.2759"W	133.35				638077.76	1332101.60	429224.49	1331663.59	169.50	Measured
LAS032	12°01'04.9210"N	61°45'05.9624"W	13.65	2953005.858	-5496192.204	1319356.635			427030.05	1328427.05		Transformed
LAS033	12°01'08.9403"N	61°45'02.6111"W	8.45	2953080.577	-5496117.090	1319476.351			427131.26	1328550.59		Transformed
LAS034	12°01'11.7667"N	61°44'39.4163"W	-15.76	2953678.833	-5495748.187	1319556.256			427832.45	1328638.04		Transformed
LAS035	12°01'08.6684"N	61°44'33.3515"W	-28.61	2953843.860	-5495667.730	1319460.464			428015.90	1328543.05		Transformed
LAS036	12°01'17.6156"N	61°44'30.8119"W	-31.42	2953883.114	-5495578.507	1319728.782			428092.42	1328817.92		Transformed
LAS037	12°01'17.2741"N	61°44'25.5696"W	-30.70	2954024.155	-5495505.976	1319718.669			428250.93	1328807.58		Transformed
LAS038	12°02'57.5261"N	61°44'36.6696"W	3.60	2953440.193	-5495128.679	1322738.691			427912.46	1331886.35		Transformed
LAS039	12°03'05.7766"N	61°44'45.2975"W	8.66	2953187.620	-5495209.950	1322987.687			427651.40	1332139.51		Transformed
LAS040	12°03'08.1050"N	61°44'31.6355"W	57.78	2953567.261	-5495043.486	1323067.915			428064.34	1332211.40		Transformed
LAS041	12°03'06.4062"N	61°44'26.7677"W	68.14	2953706.899	-5494992.306	1323019.026			428211.54	1332159.37		Transformed
LAS042	12°03'07.0212"N	61°44'16.3521"W	92.73	2953993.888	-5494860.855	1323042.642			428526.39	1332178.55		Transformed
LAS043	12°03'05.0380"N	61°44'22.2843"W	110.96	2953850.322	-5494972.719	1322986.851			428347.12	1332117.47		Transformed
LAS044	12°03'00.0280"N	61°44'18.5052"W	158.94	2953988.434	-5494988.240	1322846.306			428461.50	1331963.71		Transformed
LAS045	12°02'32.6451"N	61°44'10.5236"W	151.24	2954280.656	-5495021.971	1322021.773			428703.60	1331122.91		Transformed
LAS046	12°02'20.1533"N	61°44'04.5166"W	134.66				637742.10	1331175.90	428885.57	1330739.42	170.80	Measured
LAS047	12°01'51.3986"N	61°43'48.8615"W	117.88	2954967.465	-5494915.735	1320775.211			429359.71	1329856.73		Transformed
LAS048	12°01'46.0826"N	61°43'46.6199"W	97.79	2955034.004	-5494896.302	1320611.256			429427.64	1329693.52		Transformed
LAS049	12°01'39.6083"N	61°43'35.3547"W	68.13	2955340.002	-5494745.870	1320410.498			429768.42	1329495.01		Transformed
LAS050	12°01'32.7277"N	61°43'36.2018"W	55.20	2955332.311	-5494785.670	1320201.011			429743.01	1329283.66		Transformed

LAS051	12°01'17.1631"N	61°43'33.8893"W	36.54	2955432.466	-5494824.209	1319729.335			429813.41	1328805.69		Transformed
LAS052	12°01'13.5755"N	61°43'30.6926"W	25.81	2955523.529	-5494789.383	1319619.277			429910.16	1328695.60		Transformed
LAS053	12°01'03.1688"N	61°43'31.4785"W	5.88	2955524.902	-5494842.123	1319302.353			429886.72	1328375.95		Transformed
LAS054	12°00'57.9055"N	61°43'31.4021"W	-20.21	2955530.801	-5494848.209	1319138.734			429889.19	1328214.30		Transformed
LAS055	12°00'48.9192"N	61°43'33.1153"W	-25.73				638704.70	1328377.29	429837.67	1327938.24	10.46	Measured
LAS056	12°00'41.9109"N	61°43'31.0009"W	-30.81	2955585.040	-5494923.425	1318655.806			429901.82	1327723.06		Transformed
LAS057	12°00'30.7821"N	61°43'29.1121"W	-15.67	2955676.080	-5494972.070	1318324.471			429959.26	1327381.31		Transformed
LAS058	12°01'05.9205"N	61°43'38.4811"W	3.47	2955328.900	-5494924.875	1319384.554			429674.92	1328460.25		Transformed
LAS059	12°01'29.1227"N	61°43'55.8025"W	17.10	2954803.431	-5495053.988	1320084.726			429150.54	1329172.35		Transformed
LAS060	12°01'33.8883"N	61°44'00.4954"W	20.45	2954665.510	-5495097.227	1320228.652			429008.51	1329318.58		Transformed
LAS061	12°01'28.4604"N	61°44'07.2584"W	38.22	2954510.020	-5495240.018	1320069.221			428804.21	1329151.68		Transformed
LAS062	12°01'37.8735"N	61°44'07.5105"W	44.66	2954477.747	-5495196.095	1320353.466			428796.31	1329440.78		Transformed
LAS063	12°01'44.4815"N	61°43'59.8487"W	105.60	2954690.054	-5495101.571	1320564.764			429027.75	1329643.96		Transformed
LAS064	12°01'51.6690"N	61°43'59.4736"W	125.03	2954687.247	-5495072.390	1320784.829			429038.88	1329864.72		Transformed
LAS065	12°00'47.8447"N	61°44'12.3320"W	-23.17	2954469.482	-5495488.709	1318835.739			428652.01	1327904.08		Transformed
LAS066	12°00'53.6615"N	61°44'20.9373"W	-32.95	2954218.063	-5495570.768	1319008.529			428391.66	1328082.49		Transformed
LAS067	12°01'23.3952"N	61°44'24.5959"W	-26.12				637142.87	1329429.33	428280.19	1328995.61	10.02	Measured
LAS068	12°01'32.5809"N	61°44'21.2037"W	-24.23	2954097.078	-5495362.721	1320180.049			428382.48	1329277.83		Transformed
LAS069	12°01'40.2058"N	61°44'14.9560"W	8.90	2954255.755	-5495258.779	1320416.110			428571.14	1329512.19		Transformed
LAS070	12°01'46.0689"N	61°44'12.9450"W	-3.33	2954285.888	-5495186.370	1320589.770			428631.77	1329692.33		Transformed
LAS071	12°01'55.7250"N	61°44'13.1758"W	-15.79	2954244.682	-5495124.469	1320877.373			428624.50	1329988.89		Transformed
LAS072	12°02'01.6045"N	61°44'15.5230"W	-14.16	2954165.071	-5495126.316	1321054.410			428553.37	1330169.41		Transformed
LAS073	12°02'26.5922"N	61°44'45.5450"W	-10.39	2953291.163	-5495418.434	1321806.148			427645.03	1330936.01		Transformed
LAS074	12°02'28.1486"N	61°44'56.0641"W	-17.67	2953002.810	-5495553.980	1321851.401			427326.98	1330983.52		Transformed
LAS075	12°00'43.3750"N	61°45'25.7441"W	-13.30	2952531.480	-5496573.580	1318703.452			426432.56	1327764.76		Transformed
LAS076	12°00'29.5150"N	61°45'29.1035"W	-27.50	2952477.321	-5496687.503	1318283.927			426331.36	1327338.99		Transformed
LAS077	12°00'19.8566"N	61°46'02.7225"W	-22.69				634184.01	1327463.81	425315.15	1327041.47	13.41	Measured
LAS078	12°00'14.7952"N	61°46'06.7548"W	-30.35	2951517.102	-5497306.794	1317840.914			425193.36	1326885.92		Transformed

LAS079	12°00'31.8283"N	61°46'19.7775"W	-24.38	2951121.286	-5497402.344	1318354.103			424799.18	1327408.73		Transformed
LAS080	12°00'44.2309"N	61°46'24.1928"W	-8.44	2950973.473	-5497409.376	1318730.188			424665.37	1327789.54		Transformed
LAS081	12°00'13.8067"N	61°45'29.9098"W	-31.81	2952501.351	-5496783.785	1317810.898			426307.41	1326856.51		Transformed
LAS082	12°00'04.7988"N	61°45'28.4915"W	-33.42	2952565.640	-5496812.805	1317539.818			426350.53	1326579.89		Transformed
LAS083	12°00'07.0361"N	61°45'23.4497"W	-8.87				635373.57	1327075.27	426502.92	1326648.74	27.25	Measured
LAS084	12°00'04.0948"N	61°45'19.4943"W	-15.01	2952816.057	-5496703.836	1317522.486			426622.59	1326558.51		Transformed
LAS085	12°01'17.5537"N	61°45'56.8458"W	-34.65	2951589.322	-5496807.672	1319726.247			425491.32	1328813.69		Transformed
LAS086	12°01'40.8978"N	61°44'57.2155"W	39.03	2953141.675	-5495885.986	1320443.188			427293.50	1329532.26		Transformed
LAS087	12°01'46.0857"N	61°44'56.4683"W	24.71	2953139.231	-5495833.685	1320596.120			427315.94	1329691.62		Transformed
LAS088	12°01'50.7615"N	61°44'51.4114"W	31.80	2953263.076	-5495741.011	1320738.122			427468.70	1329835.36		Transformed
LAS089	12°00'18.0259"N	61°45'16.4754"W	-7.72	2952857.749	-5496588.474	1317942.725			426713.49	1326986.46		Transformed
LAS090	12°00'12.6245"N	61°45'15.8679"W	-8.33	2952889.994	-5496609.662	1317780.249			426732.00	1326820.58		Transformed
LAS091	11°59'47.7577"N	61°45'16.6568"W	-0.06	2952947.985	-5496768.033	1317034.552			426708.83	1326056.82		Transformed
LAS092	11°59'51.1879"N	61°45'18.6193"W	-3.78				635521.87	1326589.02	426649.40	1326162.12	32.35	Measured
LAS093	11°59'32.0393"N	61°45'32.2832"W	-23.39	2952568.245	-5497060.053	1316557.248			426236.77	1325573.64		Transformed
LAS094	11°59'39.2102"N	61°45'31.9597"W	-24.64	2952554.622	-5497014.008	1316772.528			426246.36	1325793.89		Transformed
LAS095	12°00'29.9314"N	61°45'47.7344"W	-32.66	2951977.172	-5496947.372	1318295.367			425768.05	1327351.29		Transformed
LAS096	12°00'43.3399"N	61°45'35.5317"W	-25.72	2952265.014	-5496703.172	1318699.814			426136.64	1327763.43		Transformed
LAS097	12°01'07.2445"N	61°45'20.3154"W	-11.66	2952604.646	-5496362.772	1319421.197			426596.04	1328498.02		Transformed
LAS098	12°01'15.6327"N	61°45'16.3830"W	-1.55	2952688.709	-5496267.905	1319675.408			426714.70	1328755.76		Transformed

* Determined by precise spirit levelling from GS8 (see Section "Back-up of the Vertical System").

Table 6. New Station Positions referred to the Grenada 1950 Datum.

Grenada 1953 Datum

Point	Geographic Coordinates		Cartesian Coordinates			BWI Coordinates	
	Latitude	Longitude	X [m]	Y [m]	Z [m]	Easting [m]	Northing [m]
New Points and Reference Marks							
GN01	12°31'32.8605"N	61°26'27.2807"W	2977133.433	-5469738.142	1374125.269	460737.41	1384497.62
GN02	12°30'18.9281"N	61°25'54.1353"W	2978236.826	-5469671.927	1371902.445	461742.54	1382229.07
GN03	12°29'52.1163"N	61°27'01.7137"W	2976533.718	-5470811.117	1371099.917	459704.73	1381401.30
GN04	12°29'13.3141"N	61°25'42.4900"W	2978754.121	-5469886.630	1369934.021	462098.35	1380214.63
GN05	12°28'57.2654"N	61°27'25.8887"W	2976058.106	-5471464.408	1369450.437	458978.56	1379715.17
GN06	12°28'29.2147"N	61°28'36.7962"W	2974266.185	-5472651.244	1368609.000	456840.09	1378849.35
GN07	12°28'41.4481"N	61°26'09.6057"W	2978133.918	-5470459.836	1368976.961	461282.02	1379234.18
GN08	12°28'14.1536"N	61°29'21.2964"W	2973151.961	-5473415.279	1368165.866	455497.81	1378384.17
GN09	12°27'54.3898"N	61°27'39.5110"W	2975907.952	-5472049.298	1367569.546	458571.33	1377783.25
GN10	12°27'30.2975"N	61°28'59.5124"W	2973849.386	-5473320.975	1366841.047	456157.96	1377038.51
GN11	12°27'02.5793"N	61°28'15.7417"W	2975116.993	-5472885.144	1366017.936	457480.89	1376189.81
GN12	12°12'38.1125"N	61°37'23.4250"W	2963291.879	-5485795.719	1340078.145	440985.85	1349612.31
GN13	12°13'20.8511"N	61°38'30.6359"W	2961350.963	-5486477.130	1341351.940	438953.46	1350922.12
GN14	12°12'30.0900"N	61°39'56.8528"W	2959274.175	-5488116.476	1339854.958	436350.63	1349359.85
GN15	12°12'50.6896"N	61°41'27.8623"W	2956718.290	-5489172.710	1340441.374	433600.22	1349989.22
GN16	12°11'26.8953"N	61°38'40.7351"W	2961470.782	-5487341.883	1337946.401	438652.94	1347421.98
GN17	12°11'34.4675"N	61°42'21.5904"W	2955521.035	-5490374.915	1338151.366	431979.50	1347646.54
GN18	12°10'23.5526"N	61°37'14.9030"W	2963916.780	-5486410.475	1336029.212	441249.10	1345480.14
GN19	12°09'32.5058"N	61°43'57.9045"W	2953326.958	-5492442.379	1334486.250	429073.06	1343897.95
GN20	12°09'21.7323"N	61°37'28.7123"W	2963744.833	-5486970.598	1334174.681	440834.44	1343580.97
GN21	12°08'28.7629"N	61°42'08.8903"W	2956601.224	-5491571.381	1332651.614	432369.47	1341943.75
GN22	12°07'50.2335"N	61°44'56.5159"W	2952106.201	-5493914.244	1331426.473	427304.80	1340755.37
GN23	12°08'01.2914"N	61°37'16.4127"W	2964293.498	-5487203.845	1331746.726	441209.57	1341111.04
GN24	12°07'12.7226"N	61°41'14.0626"W	2958250.003	-5491136.401	1330347.427	434029.08	1339610.32

GN25	12°06'48.1271"N	61°39'09.7074"W	2961598.332	-5489422.907	1329591.776	437788.46	1338859.51
GN26	12°05'35.9518"N	61°45'01.7357"W	2952349.344	-5494700.229	1327379.848	427150.81	1336631.31
GN27	12°05'21.4171"N	61°38'48.3906"W	2962428.776	-5489604.438	1326985.685	438436.18	1336197.37
GN28	12°05'21.0902"N	61°43'19.1295"W	2955216.950	-5493481.183	1326973.723	430252.66	1336177.89
GN29	12°04'36.6997"N	61°43'41.5873"W	2954720.757	-5493992.470	1325624.921	429575.19	1334813.93
GN30	12°03'40.1037"N	61°38'43.5644"W	2962813.212	-5490009.460	1323917.531	438586.09	1333086.11
GN31	12°02'59.0833"N	61°45'06.4619"W	2952699.556	-5495654.033	1322666.058	427012.32	1331813.62
GN32	12°02'49.6557"N	61°44'45.4655"W	2953291.921	-5495414.766	1322384.720	427647.33	1331524.67
GN33	12°02'56.3200"N	61°43'14.0276"W	2955807.744	-5494253.686	1322630.133	430411.40	1331732.02
GN34	12°01'54.9528"N	61°40'23.6391"W	2960430.146	-5491967.408	1320740.234	435564.69	1329853.06
GN35	12°01'08.2523"N	61°41'51.8222"W	2958236.283	-5493519.200	1319342.472	432900.22	1328415.80
GN36	12°00'30.9092"N	61°47'13.2300"W	2949781.822	-5498325.852	1318218.571	423183.54	1327259.87
GN37	12°00'20.3000"N	61°46'00.9775"W	2951728.381	-5497330.845	1317894.625	425368.40	1326935.82
GN38	11°59'16.8531"N	61°45'46.4288"W	2952318.330	-5497499.161	1315992.454	425809.97	1324987.70
GN39	12°12'59.4982"N	61°37'21.4606"W	2963354.974	-5485787.578	1340755.424	441044.29	1350269.18
GN40	12°11'47.7631"N	61°36'54.4330"W	2964190.669	-5485615.572	1338553.433	441863.99	1348067.24
GN41	12°07'57.6070"N	61°39'11.7150"W	2961320.093	-5489035.034	1331673.678	437725.07	1340993.24
OM01	12°31'28.8566"N	61°26'26.6516"W	2977173.876	-5469772.713	1374010.281	460756.65	1384374.69
OM02	12°30'18.1469"N	61°25'57.9101"W	2978141.201	-5469734.650	1371879.934	461628.67	1382204.84
OM03	12°29'55.1011"N	61°27'00.3658"W	2976563.719	-5470781.100	1371191.192	459745.22	1381493.05
OM04	12°29'15.3131"N	61°25'42.6991"W	2978745.973	-5469884.873	1369995.728	462091.90	1380276.01
OM05	12°28'58.0309"N	61°27'30.6182"W	2975930.189	-5471528.123	1369473.387	458835.77	1379738.39
OM06	12°28'28.6878"N	61°28'35.0517"W	2974315.062	-5472630.859	1368593.619	456892.78	1378833.27
OM07	12°28'42.3895"N	61°26'07.7424"W	2978182.834	-5470432.013	1369006.356	461338.20	1379263.21
OM08	12°28'11.1015"N	61°29'22.1377"W	2973144.625	-5473455.000	1368076.759	455472.60	1378290.38
OM09	12°27'56.7168"N	61°27'38.7878"W	2975919.953	-5472025.657	1367639.453	458593.01	1377854.76
OM10	12°27'32.2222"N	61°28'56.0086"W	2973937.211	-5473260.977	1366899.229	456263.61	1377097.83
OM12	12°12'36.4485"N	61°37'21.2743"W	2963356.308	-5485778.203	1340029.124	441050.90	1349561.30
OM13	12°13'19.0509"N	61°38'31.0590"W	2961350.653	-5486503.477	1341300.332	438940.76	1350866.82

OM14	12°12'27.7674"N	61°39'58.2390"W	2959244.556	-5488149.838	1339785.252	436308.84	1349288.47
OM15	12°12'49.9574"N	61°41'26.4685"W	2956759.796	-5489160.919	1340420.369	433642.35	1349966.78
OM16	12°11'26.0998"N	61°38'39.2256"W	2961514.318	-5487326.473	1337922.929	438698.58	1347397.60
OM17	12°11'32.8546"N	61°42'19.6555"W	2955578.472	-5490358.212	1338103.368	432038.01	1347597.07
OM18	12°10'23.0688"N	61°37'11.5294"W	2964008.494	-5486365.664	1336014.904	441351.07	1345465.42
OM19	12°09'37.3295"N	61°43'59.8755"W	2953258.781	-5492441.418	1334630.727	429013.35	1344046.03
OM20	12°09'23.2384"N	61°37'29.8496"W	2963711.900	-5486981.978	1334220.805	440800.01	1343627.18
OM21	12°08'29.4927"N	61°42'09.4351"W	2956586.746	-5491579.238	1332674.564	432352.98	1341966.15
OM22	12°07'48.9375"N	61°44'55.4652"W	2952140.127	-5493910.263	1331388.440	427336.59	1340715.60
OM23	12°07'56.9516"N	61°37'16.9929"W	2964291.153	-5487236.411	1331616.254	441192.22	1340977.73
OM24	12°07'10.5175"N	61°41'13.6930"W	2958267.877	-5491146.012	1330281.763	434040.33	1339542.62
OM25	12°06'47.0002"N	61°39'11.4569"W	2961556.070	-5489455.995	1329558.303	437735.62	1338824.83
OM26	12°05'37.2317"N	61°45'06.2553"W	2952224.991	-5494757.552	1327418.276	427014.17	1336670.49
OM27	12°05'19.0186"N	61°38'48.5342"W	2962432.260	-5489620.034	1326913.609	438431.94	1336123.70
OM28	12°05'18.7544"N	61°43'20.2265"W	2955194.360	-5493509.219	1326903.320	430219.57	1336106.12
OM29	12°04'38.8945"N	61°43'40.6316"W	2954740.864	-5493968.836	1325691.470	429604.01	1334881.37
OM30	12°03'41.9766"N	61°38'45.9059"W	2962748.738	-5490039.106	1323975.409	438515.23	1333143.53
OM31	12°02'58.5729"N	61°45'07.2905"W	2952679.702	-5495670.030	1322651.023	426987.29	1331797.92
OM32-1	12°02'48.0511"N	61°44'44.2658"W	2953331.152	-5495411.114	1322337.585	427683.65	1331475.42
OM32-2	12°02'49.7923"N	61°44'45.6625"W	2953286.497	-5495417.263	1322388.932	427641.37	1331528.85
OM33	12°02'58.0273"N	61°43'16.9819"W	2955724.428	-5494287.423	1322681.692	430322.04	1331784.36
OM34	12°01'51.3073"N	61°40'22.9980"W	2960457.435	-5491977.170	1320630.299	435584.20	1329741.13
OM35	12°01'06.7138"N	61°41'50.4590"W	2958274.197	-5493502.639	1319294.865	432941.48	1328368.59
OM37	12°00'21.9381"N	61°46'02.1387"W	2951692.660	-5497338.574	1317943.936	425333.25	1326986.10
OM40	12°11'51.3978"N	61°36'55.6874"W	2964146.761	-5485614.076	1338662.899	441825.93	1348178.81
OM41	12°07'58.4837"N	61°39'14.0602"W	2961256.119	-5489065.800	1331700.526	437654.16	1341020.08

Further Development of the Geodetic Network

The most important tasks for further development of the geodetic network are

1. Establishment of the delayed CORS network, which will ensure that the national geodetic reference system is accurately tied to the ITRF and accessible to GPS users in a minimally acceptable fashion anywhere in the country.
2. Development of an accurate geoid model through direct measurements of the separation between the geometric and orthometric datums by GPS leveling. The easiest way is to perform spirit leveling of the stations from the new geodetic network.