

REQUEST FOR EXPRESSIONS OF INTEREST (CONSULTING SERVICES – INDIVIDUAL SELECTION)

COMMONWEALTH OF DOMINICA DISASTER VULNERABILITY REDUCTION PROJECT

Loan No./Credit No./ Grant No.: **TF016912/Credit No.5495-DM/Grant No.TF016955**

Assignment Title: *Individual Consultant to Provide Consulting Services to Complete the Establishment of the National Geodetic Control Network, Undertake Necessary Training and Provide General Geodesy Support for Effective Network Functioning*

Reference No.: **PPCR/DVRP/CS-06/18**

The Government of the Commonwealth of Dominica has received financing from the World Bank toward the cost of the Disaster Vulnerability Reduction Project, and intends to apply part of the proceeds for consulting services.

The consulting services (“the Services”) include *completing the Establishment of the National Geodetic Control Network, undertake necessary training and provide general Geodesy Support for Effective Network Functioning*. The consultancy services are required for a period of fifty five (55) working days over an estimated twelve (12) month period and is expected to commence in February 2019.

The detailed Terms of Reference (TOR) for the assignment is attached to this request for Expressions of Interest.

The Ministry of Environment, Climate Resilience, Disaster Management and Urban Renewal now invites eligible Consultants to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services. The shortlisting criteria are:

REQUIRED QUALIFICATIONS AND EXPERIENCE

The consultant should possess the following minimum qualification and experience:

- The Consultant shall possess an advanced degree in geodesy, geomatics, land information systems, or recognized professional registration in geodetic/land surveying, or a related field.
- Possess at least ten (10) years of related experience.
- The Consultant must demonstrate significant experience with the establishment of geodetic controls including both horizontal and vertical control using GPS based technologies.

- In addition the Consultant must provide a portfolio and references for similar or related projects.
- The Consultant must have experience in teaching, conducting training and stakeholder consultations.
- Language Requirement: Ability to speak and write fluently in English.
- Experience within the last five years with a similar assignment.

The attention of interested Consultants is drawn to Section III, paragraphs, 3.14, 3.16, and 3.17 of the World Bank's "Procurement Regulations for IPF Borrowers" July 2016 setting forth the World Bank's policy on conflict of interest. In addition, please refer to the following specific information on conflict of interest related to this assignment (*i.e.* [3.17 of the Procurement Regulation](#)).

A Consultant will be selected in accordance with the Individual Consultant Selection Method set out in the Procurement Regulations.

Further information can be obtained at the address below during office hours 8:00 a.m. to 5:00 p.m on Mondays and 8:00 a.m. to 4:00 p.m on Tuesdays to Fridays.

Expressions of Interest must be delivered in a written form to the address below (in person, or by mail, or e-mail) by 4:00 p.m. on January 7, 2019:

Attn: Collin Guiste
Project Coordinator
Disaster Vulnerability Reduction Project
38 Cork Street (First Floor)
Roseau, Commonwealth of Dominica
Tel: (767) 266 3139 / 266 3199
E-mail: ppcrdvrp@dominica.gov.dm / ppcrdvrp@gmail.com

World Bank Pilot Program for Climate Resilience/Disaster Vulnerability Reduction Project (PPCR/DVRP)

TERMS OF REFERENCE (TOR)

For Consulting Services to Complete the Establishment of the National Geodetic Control Network, Undertake Necessary Training and Provide General Geodesy Support for Effective Network Functioning

1. Background

The Government of the Commonwealth of Dominica (GoCD) has an ongoing Light Imaging Detection and Ranging (LiDAR) Project for the acquisition of LiDAR Topography, Bathymetry and Orthophotography under the World Bank Pilot Programme for Climate Resilience/Disaster Vulnerability Reduction Project (PPCR/DVRP). This project is designed to assist the GoCD with improving disaster/climate resilience through various activities including rehabilitation of infrastructure and the development of tools and modeling systems to support engineering scale analysis of coastal and hydrologic processes throughout the island.

Among the activities planned under the project is the establishment of geodetic quality benchmarks to monitor coastal subsidence, the creation of a large scale Digital Elevation (DEM) and Bathymetric (BAT) Models, the development of hydrological models to analyze water flow, drainage management, flood control and land use planning activities. Activities to establish a National Geodetic Control Network (NGCN) including both vertical and horizontal datum had already commenced in support of the LiDAR project. All monuments and tools required for the network were purchased. At least 52 monuments were installed prior to Hurricane Maria in September 2017.

Unfortunately, due to the passage of the hurricane some significant pieces of tools were lost. However, in order to finalise the NGCN under the DVRP, the GoCD is seeking the services of a qualified Consultant to assist with activities to complete the establishment of the National Geodetic Control Network, undertake necessary training and provide general Geodesy Support for effective network functioning.

Five (5) Continuous Operating Reference Stations (CORS) have been installed in Dominica; three (3) were installed under the DVRP composed of Trimble Net R9 receivers. Two of these are logging data but are unable to push due to unavailability of internet service. The other is not functional due to power problems in the building. The fourth is a UNAVCO CORS which has been offline since the passage of Hurricane Maria. The fifth was established under a project of the United Nations Global Geospatial Information Management (UN-GGIM). It is located on the building housing the Lands and Surveys Division and it is functional.

Two (2) tide gauges have also been installed under the DVRP. The gauge at the Portsmouth Cruise Ship Berth was totally destroyed while the other at Marigot was partially damaged by Hurricane Maria. The Marigot gauge has limited functionality while Portsmouth was replaced at a different location, which is at the Fisheries Complex Building Wharf and is fully operational.

2. Activities

Under this consultancy, the Consultant will provide the following services:

Provide technical assistance, training and analytical support to the Lands and Surveys Division (L&S) to support the ongoing installation, registration and densification of the National Geodetic Control Network including the vertical control network.

2.1 National Geodetic Control Network - Technical Assistance and Training

Work on establishing a National Geodetic Control Network has already commenced and the Consultant is expected to provide support to the Lands and Surveys Division with the ongoing installation of this network in order to ensure its full development and completion. The Consultant shall review progress to-date on the development of the NGCN and provide expert services and relevant training to the staff of the Lands and Surveys Division and other key stakeholders; as well as provide technical guidance to support the Lands and Surveys Division's activities in the improvement and finalisation of the National Geodetic Reference System with respect to vertical and horizontal controls. Under this activity, the Consultant shall provide on and off site support to the Lands and Surveys Division for the ongoing installation, analysis and modeling of the NGCN to achieve high accuracy registration with respect to WGS84 and or a suitable ITRF realization. The Consultant shall also provide training to and assist staff of the Lands and Surveys Division with geodetic modeling of the NGCN to support the development of conversion parameters between the old datum (M12 Astro) and the new datum based on WGS84/ITRF.

The Lands and Surveys Division will provide all necessary field personnel and equipment to accomplish this activity and will have primary responsibility for network installations and the collection of field data for this activity. The Consultant should also evaluate whether the capacity for carrying out the field surveys exists in house and create a work plan with clear and realistic estimates of time required for undertaking these surveys. It is also recommended that if the work estimates are found to be untenable, the consultant will suggest alternative options for acquiring the necessary personnel (consultants, contractors, firms).

Strong emphasis is placed on the technology transfer element of this activity as the intention is to realize improvements to the NGCN as well as to train staff in geodetic principals and network management so that these activities can be internalized within the Lands and Surveys Division to the fullest extent possible.

3. Specific Tasks

The Consultant will conduct a review of the progress to-date on the installation of the NGCN and make recommendations for its completion, including with respect to horizontal and vertical control references. The Consultant is required to develop a plan of action for the completion of the NGCN and implement required activities in keeping with this Terms of Reference. The Consultant will be required to provide a timeframe for establishing the basis for vertical control network.

In collaboration with the Lands and Surveys Division, the Consultant shall identify and make recommendations for the most appropriate distribution of horizontal and vertical control stations to meet the accuracy standards of first, second and third order network surveys. The Lands and Surveys Division is adequately equipped with GNSS equipment, software and personnel to provide the necessary support in the establishment of the control network. The Consultant would be required to provide some technical guidance in the effective use of these resources.

The Consultant shall provide technical guidance as necessary, identify training needs and conduct field training to staff of the Lands and Surveys Division, other government agencies and selected private sector professionals. The Consultant will provide expert guidance to ensure the completion of installation of the NGCN which will provide the basis for all subsequent surveys and mapping conducted in Dominica.

Specific elements under this activity include but are not limited to:

1. Review work done by the previous consultant in the development of the updated NGCN including the establishment of three (3) fiducial stations and nine (9) other network stations (Second Order).
2. Review relevant reports (e.g. Parameter Conversion from ITRF to M12 Astro local datum by Dr. Keith Miller) and make recommendations based on the accuracy of the method used and the inherent problems in the local trigonometric network. Determine the need for additional observations if required. A decision must be made to determine the veracity of the transformation parameters computed thus far bearing in mind that there were re-observations of collocated points used in the computations.
3. Once the recommendations are approved, implement the necessary actions in collaboration with the Lands and Surveys Division in order to complete the establishment of the NGCN. The scope of activities under implementation are outlined and itemized from six to eleven (6 to 11) below.
4. Assess the needs of users in respect of hardware and software to use and manipulate the GPS datasets (Coordinates and parameters conversion values) on completion of the surveys.

5. Review existing system status and provide advice on the hardware and software requirements, storage and backup of all digital data, raw and derived products.
6. Inspect and review the configuration of the existing Continuous Operating Reference Stations (CORS) and provide guidance/training in incorporating same into the NGCN.
7. Recommend user-friendly parameter conversion software for use by the Lands and Surveys Division and the geospatial community.
8. Review progress made in installing third order network monuments and provide advice and training in network design, observations and adjustments; assist with modeling network adjustments to include least squares analysis or other appropriate analytical tools where applicable.
9. Advise and supervise the Lands and Surveys Division as to the most suitable method to extend vertical control using benchmarks throughout the island. Connecting tide gauge benchmarks must also be considered.
10. Determine the most appropriate method to establish a vertical datum for Dominica by using existing tide gauge data and/or Geoid based data.
11. Establish guidelines for accessing and use of GPS data from the network by Surveyors, GIS users, engineers, scientists, the public and other stakeholders.
12. Recommend effective network maintenance strategies and provide relevant cost estimates.

4. Level of Effort

The consultancy services are required for a period of fifty five (55) working days over an estimated twelve (12) month period. However, the Client may choose to adjust the duration of the consultancy, once the timeframe for establishing the basis for the vertical control network is known.

During the assignment, it is expected that the Consultant will make three (3) trips to Dominica to undertake the assignment. .

1. Contract Inception – Consultant shall review progress to-date on the development of the NGCN and make recommendations for how he/she proposes to ensure the completion of the network, including a detailed work plan.
2. Consultant shall provide on and off site support for the completion of the NGCN and related training and technical support activities. Owing to the emphasis on training and field support, this activity will require a minimum of twenty (20) days on site and will require a minimum of two (2) trips specific to this activity to be scheduled in accordance with the approved work plan.

5. Deliverables

All reports under this consultancy shall be submitted in English. Reports shall be submitted in hard copy, three (3) copies and electronically in PDF & MS Word Format. Any data files shall be submitted in acceptable format as agreed by the Client. All reports and documents relevant to the Consultant's services, computer programs (as far as possible), shall become the property of the Government of Dominica. The Consultant shall provide the following reports under this activity:

1. An Inception Report and work plan coordinated with the Lands and Surveys Division for NGCN realization, to be submitted one (1) week after 1st mission which shall occur within two (2) weeks of commencement of contract.
2. Report: The Lands and Surveys Division's Standard Procedures and Guidelines for Geodetic Quality GPS observations in Dominica.
3. Report: Analysis and Development of the revised Geodetic Transformation Model from WGS84 to Dominica 1945(M12 Astro).
4. Report: Recommendations for maintaining the National Tide Gauge Reference Stations including survey accuracy standards for the tide gauge network.
5. Report: Guidelines for Surveyors using the NGCN and National CORS correction data.
6. Report: NGCN Data Management and Maintenance Guidelines and requirements.
7. Progress Reports NGCN:
 - Two (2) Reports at agreed upon timelines documenting activities undertaken, training and progress under this activity.
 - Copies of all training materials developed or provided during this activity.
8. Consultant's Final Report

Details of Key Reports:

Inception Report

Within one (1) week after first mission which is expected to occur within two (2) weeks of commencement of the assignment, the Consultant is required to submit three (3) copies of the Inception Report containing the proposed work plan, review/analysis of work completed to-date on the NGCN, recommendations for completing the network, training to be conducted (by the consultant), benchmarks, key milestones, next steps, immediate action plan and other information the Consultant may consider relevant.

Progress Reports

Progress reports shall be delivered to the PCU as agreed by both parties. The progress reports should summarize the work completed in terms of the work plan, highlighting issues, training done, meetings held and decisions made during the reporting period, presenting the upcoming activities/ targets and next steps and any other information. Progress reports shall be concise noting progress to-date; challenges encountered (if any) and proposed resolutions to issues identified and any other information the Consultant may consider relevant. The report will also contain the hardware and software required for the storage and backup of the digital data, raw and derived products.

Final Report

Final Report shall include a full description of the network installed with maps, photos and georeferenced points for location of all survey monuments, geodetic controls, vertical and horizontal controls and all relevant information. In accordance with the Consultants work plan, the Consultant shall provide a task summary report detailing findings, recommendations, including for geodetic controls, training results and agreements reached with the Client and stakeholder agencies. It shall also include recommendations to the Client for expansion, further training, further software/hardware requirements (if necessary) and actions to be taken for sustainability of the network and other information the Consultant may consider relevant.

6. Reporting and Coordination

The Consultant will report to the Project Coordinator, PCU/DVRP and/or his designate and will work in close collaboration with the Lands and Surveys Division. Administrative and financial matters related to the consultancy will be handled by the Project Coordination Unit.

All reports should be submitted and approved by the Client before presented in workshops/meetings. All reports and documents must be provided in English.

7. Duration of Consultancy

The Consultancy is for a total of fifty five (55) working days over an estimated twelve (12) month period. One day is considered to be eight (8) hours worked. Activities under this contract are expected to commence in February 2019 and continue through to February 2020.

8. CLIENT'S RESPONSIBILITY

The Project Coordination Unit will:

- Facilitate the Consultant by making available existing relevant information, related existing consultant reports and data, to assist the Consultant in the timely completion of the various stages of the assignment (in digital format if available).
- Ensure timely review of the reports submitted by the Consultant within ten (10) working days as stated in these Terms of Reference.
- Assist in initiating the consultation and co-operation with other agencies required to provide support to the Consultant for the realization of the relevant aspects of the assignment.
- Facilitate access to the sites.
- Provide office space for one person while in Dominica.
- Assist with local transportation to project areas.
- Be responsible for coordinating Workshops/Training and assume the costs related to organizational logistics for delivery of the Workshops/Training.
- The PCU will be responsible for the circulation of all reports.

9. CONSULTANT'S RESPONSIBILITY

- The Consultant shall submit reports as specified in this TOR as well as ensure its timely submission to the PCU.
- Adhere to the requirements of the terms of reference
- The Consultant should provide international and domestic* transportation.
- Be responsible for the supervision of technical staff (if any) including providing all office space, equipment, materials, accommodation, office requirements and transportation.

The Consultant shall execute the services in accordance with the laws, customs and practices in Dominica and use the appropriate international standards for preparation of technical information.

10. QUALIFICATION REQUIREMENTS AND EVALUATION PERFORMANCE CRITERIA

The minimum required qualifications and experience are:

- The Consultant shall possess an advanced degree in geodesy, geomatics, land information systems, or recognized professional registration in geodetic/land surveying, or a related field
- Possess at least ten (10) years of related experience
- The Consultant must demonstrate significant experience with the establishment of geodetic controls including both horizontal and vertical control using GPS based technologies
- In addition the Consultant must provide a portfolio and references for similar or related projects

- The Consultant must have experience in teaching, conducting training and stakeholder consultations
- Ability to speak and write fluently in English
- Experience within the last five years with a similar assignment.