

**ST. VINCENT & THE GRENADINES REGIONAL DISASTER
VULNERABILITY REDUCTION PROJECT**

**IDA CREDIT NOS. 4986-VC & 5450-VC; SCF-PPCR LOAN No. TF011132;
SCF-PPCR GRANT NOS. TF010206 & TF016733**

**REQUEST FOR EXPRESSIONS OF INTEREST
Design for the rehabilitation of the Chateaubelair jetty
Ref. No.: SVGRDVRP-C-QCBS-27**

St. Vincent and the Grenadines has received financing from the World Bank towards the cost of the Regional Disaster Vulnerability Reduction Project, and intends to apply part of the proceeds for consulting services. The project is seeking to rehabilitate the Chateaubelair jetty. This consultancy has an estimated duration of thirty-six (36) months.

The objective of the proposed consultancy is to provide technical support to the Public Sector Investment Program Management Unit of Ministry of Economic Planning, Sustainable Development, Industry, Information and Labour, Kingstown, St. Vincent and the Grenadines for the preparation and execution of detailed engineering designs, preparation of technical parts of bidding documents and construction supervision of civil works during the construction and defects liability periods.

The MOEP now invites eligible consultants to indicate their interest in providing the services. Interested consultants must provide information indicating that they are qualified to perform the services (brochures, description of similar assignments, experience in similar conditions, availability of appropriate skills among staff, etc. – limited to 30 pages).

Consultants may associate to enhance their qualifications. The associations should clearly indicate the form of the association (Joint-venture or sub-consultancy; member in charge; other member/s and/or sub-consultants). Joint ventures should submit letters of intent indicating their intent to form a joint venture if awarded the contract and shall provide the above mentioned information for each member of the joint venture.

Firms should have experience in harbor, wharf, jetty and/or coastal works design with at least two successfully completed similar assignments during the past five (5) years, experience working in the Caribbean or a SIDS. Firms should have qualified professional staff in the following areas: Civil/Coastal Engineering, Environmental Engineering (CE), Land Surveyors, and Quantity Surveyors.

A Consultant will be selected in accordance with the Quality and Cost Based Selection (QCBS) method set out in the World Bank's [*Guidelines: Selection and Employment of Consultants \[under IBRD Loans and IDA Credits & Grants\] by World Bank Borrowers*](#), January 2011. The attention of interested Consultants is drawn to paragraph 1.9 setting forth the World Bank's policy on conflict of interest.

Interested consultants may obtain further information at the address below during office hours, 8:00 am to 4:00 pm. Expressions of interest must be delivered in written form to the address below (in person, or by mail) no later than 4:00:00 pm Eastern Caribbean Time on **Friday September 30, 2016.**

The Director of Planning
Ministry of Economic Planning, Sustainable Development, Industry, Information and Labour
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**Saint Vincent and the Grenadines
Regional Disaster Vulnerability Reduction Project**

Terms of Reference

for the

**Design for the rehabilitation of the Chateaubelair jetty
SVGRDVRP-C-QCBS-27**

**Ministry of Economic Planning, Sustainable Development, Industry, Information and
Labour
Saint Vincent and the Grenadines**

September 2016

TERMS OF REFERENCE (TOR)

1. BACKGROUND

The Government of Saint Vincent and the Grenadines (GOSVG) is part of an Organisation of Eastern Caribbean States Regional Disaster Vulnerability Reduction Project (RDVRP) to reduce its vulnerability to natural hazards and climate change. The regional project is financed through grants and credits received from the World Bank (Bank), the Climate Investment Fund's Pilot Program for Climate Resilience, and the European Union's 11th European Development Fund B-envelope.

Under Component 2 of this programme titled "Regional Platforms for Hazard and Risk Evaluation and Applications for Improved Decision Making" the GOSVG has identified a number of priority investments, one of which is to mitigate vulnerability to the North Leeward communities by providing safe berthing access to the residents in times of natural disasters, specifically, in the town of Chateaubelair.

2. OBJECTIVE

The objective of the proposed Consultancy is to provide technical support to the Ministry of Economic Planning, Sustainable Development, Industry, Information and Labour (the Client), for the preparation and delivery of detailed design and work requirements to be used in the construction bid documents for the reconstruction of the Chateaubelair Jetty, as well as for construction supervision (see Section 5).

3. DURATION

It is expected that the consultancy will last a period of thirty (36) months to produce the deliverables listed in section 7. Phase 1 design is estimated to be nine (9) months and phase 2 – Supervision is estimated to be twelve (12) months (with three (3) months between phases 1 and 2 for the procurement process) and a defects liability period of twelve (12) months.

4. GENERAL REQUIREMENTS

The Client will be contractually responsible for the Consultant's assignment, however the Consultant will work closely with the Ministry of Transport, Works, Urban Development and Local Government (MOTW). The Consultant will be responsible for carrying out pre-construction services to provide approved construction drawings, Bill of Quantities, and technical specifications for all civil and marine works in accordance with acceptable international design standards and engineering code of practices.

It is understood that the Consultant will provide all the necessary technical and support staff to

administer and manage all the necessary field and office work that are necessary to produce the deliverables. The Consultant will also carry out any additional services, which the Client may reasonably require relating to the design of the project.

The Consultant will liaise closely with the Client's Social Development Specialists and Communications Specialist within the Public Sector Investment Programme Management Unit (PSIPMU) in order to ensure that communities are consulted, informed and forewarned of planned site activities in a timely manner. The communities are to be given opportunities to ask questions and be kept informed of the nature, timing/duration, extent of activities and likely short, medium and long-term impacts on them. These consultations should be held together with the PSIPMU Social Development Specialists, documented and a log kept of all such communications.

5. SCOPE OF SERVICES

The scope of services for this contract is to provide design services and construction supervision.

A design brief describing the design requirements is contained in Attachment A. The scope of services shall include, but not be limited to, the following main activities:

General Services

The services shall be carried out in accordance with generally accepted standards of professional practice, following recognized engineering and management principles and practices for Pre Contract Services. The Consultant's scope of work is understood to cover all activities necessary to accomplish the stated objectives of these services while adhering to the aforementioned principles and practices, whether or not a specific activity is cited in these TOR.

The services will include carrying out desktop and field investigations, preparation of detailed Engineering Designs, Technical Specifications, Bills of Quantities, engineer's estimate and more generally provide all required technical information necessary for the procurement of the civil works contract following the World Bank's procurement guidelines.

Finally, freely accessible data and analysis is a core component of this project. Therefore, all geospatial data collected and created by project activities must be preserved, consolidated and transferred to the GOSVG and the World Bank upon project completion, in a well-known or standard electronic format. This format is outlined in Attachment D.

Specific Services

The Consultant is expected to carry out the following specific services in order to achieve the project objectives and requirements described in the Design Brief included in Attachment A. The Consultant is expected to supplement these services, where in his own judgement it is necessary, in order to achieve the project objectives.

PHASE 1

5.1 Task 1: Inception report, Data Collection and Analysis of the site.

a. Inception Report

Following contract commencement, the Consultant will produce an Inception Report in accordance with the content of Appendix B.

b. Data Collection and Analysis of the site.

The area of study is captured in Attachment A. The investigation and analysis of the subject area will entail field, lab and desktop studies.

The field investigation will focus on characterizing the physical environment, including inter-alia, bathymetric surveys, beach profiles, wave climate (waves, currents, tides, sea level), surface hydrology, geotechnical borings and soil tests, all aimed at characterizing the nature of the site.

Data will be needed on near shore bathymetry and topography in order to undertake wave climate analysis and estimation of extreme wave heights and water levels. A Bathymetric Survey shall be carried out to produce accurate one foot contours in the area of the existing jetty. It is expected that the area surveyed would exceed two acres so as to assist in the understanding of the site. This would include the area between the jetty and west of the Chateaubelair River. The Consultant will also survey such additional areas that he considers necessary for the proper assessment of nearshore wave activity, depth of closure and other factors that he considers will affect the design of the jetty.

The mapping of the location of the failed jetty on the sea bed along with pictures shall also be a deliverable. These pictures (along with an appropriate disclaimer) will form part of the bid document to assist the Contractors pricing for removal of the submerged jetty.

With regards to wave climate, the Client will make available a recently completed report (January 2014) on the wave climate (operational and extreme) in an adjacent bay (Dark View) to the west. (See section 6 - Client Input). This information is expected to reduce significantly the requirement for field and desktop data collection related to the assessment of wave climate in the project location.

There is a 2006 study by DLN Consultants that will be made available, that provides flow data for the Chateaubelair River, west of the jetty. The Consultant may use information from this report to model the effect of flood induced currents that could produce scour at the pile locations. (See section 6 - Client Input).

Geotechnical borings shall be carried out on the sea bed to determine the design depth of the piles below the sea bed. There shall be a minimum of four (4) offshore borings to an estimated minimum depth of thirty (30) feet below the sea bed. This may vary based on site conditions. Soil samples shall be taken at maximum 5 feet centres.

Tests in each borehole shall include Sieve analysis, Triaxial (if possible), Shear and such other tests the Consultant feels necessary for his design.

All these results will need to be collated in a geospatial database.

Desktop activities will include thorough investigations of existing information, records and maps on geology, morphology, hydrology, seismic, coastal erosion processes and hurricane activity. Aerial photographs from different periods, if available, may help clarify the morphodynamic processes. Information shall be obtained from both, local and regional sources such as:

Local:

- Ministry of Transport, Works, Urban Development and Local Government – MOTW
- National Emergency Management Organization – NEMO
- Seismic Unit, Ministry of Agriculture, Rural Transformation, Forestry and Fisheries
- Ministry of Housing, Informal Human Settlements, Land and Surveys, and Physical Planning
- SVG Port Authority
- Fisheries Division
- National Parks, Rivers and Beaches Authority

Regional:

- University of the West Indies (Seismic Research Centre of Tsunami, Earthquake and Volcanic Risk)
- Trinidad & Tobago Meteorological Service
- Caribbean Institute for Meteorology & Hydrology (CIMH)
- Caribbean Disaster Emergency Management Agency CDEMA
- Caribbean Community Climate Change Centre
- Intergovernmental Oceanographic Commission
- National Hurricane Center (NOAA)
- US Geological Survey (USGS)

In addition to the above-mentioned institutions, information from other sources shall also be identified and reviewed by the Consultant.

At the end of this task, **an Inception report and a data collection/analysis Report** will be the deliverable.

5.2. Task 2: Preliminary Engineering Design.

Based on the activities under Task 1, Task 2 will comprise those activities required to present a preliminary jetty design. This will be presented in a Preliminary Design Report. The Report is expected to contain preliminary design drawings, cost estimates (see section 7 for details) and the (Environmental Impact Assessment) EIA.

Preliminary Design (Attachment A)

Under this task, the Consultant shall undertake the following specific activities:

- a) Identification of the hydraulic, hydrologic, topographic and bathymetric variables affecting coastal processes and surrounding watershed areas. Mid-century climate change scenarios should be used to assess infrastructure design requirements. Climate variables could include mean sea level rise, incidence of hurricane, tropical storms and associated storm surge heights.
- b) Designs will be expected to also consider the occurrence of seismic forces and currents from the adjacent river during flood conditions.
- c) Selection of an appropriate range of return periods for use in a Least Cost Analysis (wave return period vs. cost). It is anticipated that the return periods will span between 50 and 150 years at a minimum.
- d) Using the return periods previously selected, the consultant shall use the necessary coastal process modelling and studies already completed, to determine wave heights, storm surge levels, projected erosion rates, etc, that will be necessary for the preliminary jetty design.
- e) Develop and present viable alternatives for the jetty in terms of plan footprint viz. finger, L-shape etc. The consultant will optimise each alternative using a least cost approach (wave return period vs. cost) considering in his analysis inter-alia; construction costs, project economic life, maintenance costs, replacement costs and benefits.
- f) The consultant shall assess the return period wave associated with the least-cost design and make a recommendation regarding its adoption or such adjusted wave design return period he considers more appropriate.
- g) Prepare preliminary design, implementation schedule and estimate of resources needed, including base costs, physical and price contingencies for the development of the design option proposed.

Environmental Impact Assessment

An integral part of the design process, will be an Environmental Impact Assessment (EIA) related to the proposed construction work. The EIA shall solicit and include comments from the public regarding the design of the jetty and the operational requirements as viewed by the stakeholder users. The Consultant will carry out this EIA in accordance with the Environmental Management Framework (EMF) developed for the project by the GOSVG / World Bank to assess the environmental impact and mitigative measures for various interventions. The EMF can be viewed at:

http://www.gov.vc/images/stories/pdf_documents/EMF_March_2016.pdf

The objective of the EIA is the aiding in the selection of the best jetty design solution. The EIA will include a characterization of the marine flora and fauna in the area potentially affected by the works. The EIA will include an assessment of the proposed design's effects on the shoreline, beach, and nearshore environments, due to changes in wave energy, currents, sediment transport from the river mouth, and other factors. The EIA will identify any permit requirements from environmental and/or planning authorities.

The Client and the MOTW shall have two (2) weeks to provide comments. The Consultant shall incorporate comments received and prepare a Draft EIA for public comment to be published by the Client pursuant to the Bank's safeguard policy and national requirements. During a period of three (3) weeks following delivery of the draft for public comment, the Consultant shall advertise and conduct one (1) to two (2) public meetings in the Chateaubelair area, presenting the findings of the EIA and soliciting comments. A record of these meetings shall be kept and comments received shall be documented and incorporated in the final EIA. At the conclusion of the three (3) week meeting period, the Consultant shall have two (2) weeks to incorporate comments received and shall deliver the Final EIA to the MOTW.

The Consultant shall, specifically, undertake the following EIA and SIA activities:

- i. Conduct initial environmental screening to identify potential environmental impacts due to the proposed alternatives and measures to mitigate negative impacts.
- ii. Conduct initial social screening to determine the needs of potential users (e.g. fishermen, yacht owners, ferry operators, coast guard, Port Authority, informal transport operators, NEMO, Fisheries Division, villagers, etc., who will be affected positively or negatively by the proposed jetty reconstruction project. The consultant should ensure a wide cross section of villagers is engaged in terms of genders, age groups and employment status.
- iii. Applying qualitative and quantitative techniques, identify and prioritize any potential social issues or impacts of the proposed alternatives for the project during implementation and operation and the estimated costs of recommended mitigation measures both during implementation and in the long term. The Consultant should liaise closely with the PSIPMU Social Development Team in the assessment of social risks and impacts and in the recommendation of mitigation measures.

At the end of this task, **Preliminary Design Report** will be the deliverable. The Consultant shall also to make a presentation of the report to the Client and is required to do this via the use of a PowerPoint presentation.

5.3 Task 3: Detailed Engineering Design.

Following the evaluation of preliminary designs and selection of the final option by the Client, the Consultant shall proceed to final detailed engineering documents. This will include but be limited to the following specific tasks:

- (a) Prepare final designs, Bills of Quantities for the preferred alternative, inclusive of, but not limited to, detailed construction drawings, technical specifications, implementation schedule, cost estimates, including costs of any measures to mitigate environmental and social impacts, environmental and social management plans. The client will be responsible for the assembly of the bid document and procurement process;
- (b) Engineering design specifications and overall project design should conform to acceptable national/international building codes.

- (c) Prepare a project specific Environmental and Social Management Plan (ESMP) for inclusion in the bid documents to address the environmental and social impacts preliminarily identified in Task 2 during construction and operation. The ESMP shall include recommended mitigation measures to be adopted during implementation and in the long term, as well as cost estimates for the recommended measures. The environmental plan should specifically address, but not necessarily be limited to the following: dredging requirements, traffic management; waste disposal; management of construction materials (transportation, storage and waste disposal); surface water drainage; mitigation of dust and noise nuisance; and community relations. The social management plan should analyse potential social risks and impacts including but not limited to land acquisition/resettlement or economic displacement, and recommended mitigation measures should reflect the principles and guidelines laid out in the Resettlement Policy Framework for the project.
- (d) Finalise the Least Cost Analysis for the preferred alternative, including sensitivity analyses, which should also address the various climate change scenarios.
- (e) Conduct all other requisite additional engineering, geological, geo-technical, bathymetric and topographical investigations and studies necessary to design the proposed works, including identification and assessment of potential sources of materials for the works, if required.
- (f) Prepare a detailed Draft Maintenance Plan for the proposed infrastructure, including the standards, procedures, frequency, budget estimates, equipment and personnel qualifications and experience requirements for effective performance of maintenance operations.

5.4 Task 4: Bid documentation and Procurement.

The Client shall prepare the bid documents. The Consultant, however will:

- (a) Provide to the Client, the Construction Drawings, Bills of Quantities and Technical Specifications.
- (b) Conduct pre bid site meeting, accompany to site visits with contractors, provide clarification to the bidding documents if raised by potential bidders and prepare minutes of the pre bid site meetings.
- (c) Provide advice to the Client during the procurement process, including bid invitation wording, clarifications on all technical queries received from the bidders, preparation of the bid evaluation report, advice on contractual matters and recommendation for contract award in accordance with the World Bank's procurement guidelines.

5.5 Task 5: Final Design Report.

The Consultant will provide a **Final Design Report** in accordance with the template set out in Attachment C.

PHASE 2

5.6 Task 6: Construction Supervision Phase

Pile Inspection

During the construction phase, the Consultant shall carry out supervision duties inclusive of pile inspection. These duties will require technical decisions to be made regarding pile location, pile replacement, cessation of piling, acceptable alignments, etc. The piling inspection shall record at the minimum, piling information as identified below:

- Blow Count vs. Depth
- Hammer Performance Observations
- Installed Location vs. Plan Location
- Pile Alignment vs. Alignment Tolerances
- Pile Orientation vs. Plan Orientation
- Final Tip Elevation
- Cut-off Elevation
- Pay Length
- Obstruction Depths
- Predrill / Spud / Jet Lengths
- Internal Inspection Observations
- Obstruction Removal Procedures
- Initial and Final Pile Cushion Thickness
- Pile Cushion Replacement Depths
- Fuel Setting or Stroke Changes
- All Start and Stop Times & Dates
- Pile Splice Type, Depth, and Time
- Hammer Cushion Material & Thickness
- Compliance with EMP requirements

General Supervision duties

- a) Advise the contractor on the interpretation of the engineering drawings and technical specifications and issue supplementary details and instruction during the construction period, as required.
- b) Review the contractor's work plan including construction schedule and comment on the procedures, methods and sequence of the work.
- c) Review engineering drawings and prepare amendments if necessary with the prior approval by the Client.
- d) Consider and advise on alternative methods, equipment and materials proposed by the contractor and provide clearance to the contractor with the prior approval of the Client.

- e) Provide advice on the validity of any changes proposed by the contractor for additions or deletions to the contract and advice on the issue of variation orders to the contractor.
- f) Process contractor's progress and final requisitions and issue progress certificates for the Client's acceptance.
- g) Maintain records related to the contracts.
- h) Arrange and prepare minutes of the monthly site meetings.
- i) Review job monthly progress reports, make comments and recommend any appropriate action as required.
- j) Provide technical advice to the Client and recommend appropriate actions if needed during construction Phase on planning and scheduling, .
- k) budgeting, estimating, and cost and quality control.
- l) Submit monthly progress reports to include:
 - Planned and actual progress of works
 - Status of incomplete works
 - Material, labour, plant availability
 - Revised schedules
 - Design changes and variations
 - Financial particulars
 - Progress photographs
 - Environmental monitoring
 - Factors adversely affecting progress of project
 - Decisions yet to be taken
 - weather conditions
 - accidents on site and any other relevant details.
- m) Quarterly Financial Report
 - Contract particulars
 - Contractor's claims
 - Projected final costs of projects (Revised Bills of Quantity)
 - Projected net variances
 - Expenditure to date
 - Cash- flow projections.
- n) Project Management Information System:

The Consultant will propose setting up of a new computer based Project Management Information System (PMIS) which will keep an up to date record of the design reports, procurement process for the award of civil work contracts, signed contract, bill of quantity,

quality control management system, environmental and social management system, progress reports, minutes of the meeting, certification of contractor's invoices, completion reports and any other project related information on a web-based share point information system which can be used by all the three parties Consultants, Employer and the funding agencies. However the Client will decide a list of authorized users to whom a pass word would be given for making use of PMIS.

The Consultant will be required to produce a pile inspection and supervision report following the conclusion of the piling activity. See section 7(f).

It is expected that the Consultant considers stakeholder engagement as an on-going process with requirements for information disclosure, consultation and engagement throughout all study phases, from the data collection stage, to the identification of alternatives and final design stage. Meaningful consultation should be undertaken about the project's environmental and socio-economic aspects, related to climate change, with relevant stakeholders in order to take their views into account. The extent and degree of engagement required by the consultation process should be commensurate with the project's risks and adverse impacts, and with concerns raised by stakeholders. The Consultant is also expected to document the public participation. The Consultant should liaise closely with the Social Development Team within the PSIPMU to undertake public and stakeholder consultation, to ensure guidelines in the Resettlement Policy Framework are followed.

The supervision of the works, i.e., phase 2 will be conditional to the performance of the Consultant during phase 1.

6. INPUTS

The Client;

- a) All available plans, pictures, reports, topographical and bathymetric surveys, etc. of the proposed works that might be necessary, applicable and already in the Client's possession for the execution of the work required under these TOR. The Client will not be responsible for data collection of any type,
- b) Access to the project site,
- c) The Client shall liaise with other ministries, departments, and authorities, etc. in order to introduce the Consultant. The Consultant however shall be fully responsible for collecting data, information, permits, etc. from these agencies,
- d) The Client will assist the Consultant in obtaining visas, work permits, driving licenses, car registration, etc. and any other formalities found necessary for the Consultant's personnel entering or leaving SVG for the purpose of carrying out the services.
- e) The Client would make available its laboratory facilities and staff for use by the Consultant in performing tests both in the laboratory and in the field to the extent that they are capable of, or have the necessary equipment to undertake such tests. These tests are very limited and consist of density testing, sieve analysis and DCP tests.

Existing/Available Data

- Report (January 2014) by Smith Warner International Ltd on the wave climate (operational and extreme) at Dark View Bay, an adjacent bay located to the west of Chateaubelair Bay.
- Study by DLN Consultants (Islandwide Flood Risk Assessment Study - 2006), which provides flow data for the Chateaubelair River, west of the jetty.
- Resettlement Policy Framework (RPF) (2016), which clarifies the resettlement principles, organizational arrangements, and design criteria to be applied to World Bank subprojects. For operations that may involve involuntary resettlement, the Bank requires that the Borrower screens subprojects to ensure their consistency with World Bank Social Safeguards Policy 4.12.

https://www.dropbox.com/sh/j79zx9uyh5kge5v/AACMo6X3hy7Ego5qa_AFqoyda?dl=0

The Consultant

The Consultant will be required to undertake the various activities outlined in Section 5 of these TOR.

The Consultant will provide the office space, manpower, transportation, equipment and software required to carry out the assignment and be responsible for obtaining all additional information for the execution of the services necessary for the project.

7. REPORTING REQUIREMENTS (Deliverables)

Throughout the preparation of the various tasks of the study, the Consultants shall submit the following documents/outputs (in MS Word and GIS format, respectively) to Client's satisfaction:

- a) **Inception Report (Task 1a):** within three (3) weeks of commencing the works, the Consultant is required to submit an Inception Report. A typical sample template is attached in Appendix B.

The Client/MOTW should forward comments on the report to the Consultant within two (2) weeks of receipt.

- b) **Data collection and analysis Report (Task 1b):** within six (6) weeks of commencing the works, the Consultant is required to submit data collection and analysis report. A typical sample template is attached in Attachment B.

The Client/MOTW should forward comments on the report to the Consultant within two (2) weeks of receipt.

- c) **Preliminary Engineering Design Report (Task 2):** Within sixteen (16) weeks after acceptance of the **Inception and data collection and analysis Report**, the Consultant is required to submit a Preliminary Design Report and make a presentation to the Client/MOTW. The presentation would to the form of a workshop, where technical knowledge transfer on all aspects of the jetty design will be the primary objective. The audience will include engineers from the MOTW and is not expected to exceed eight (8) hours.

The Client/MOTW should forward comments on the report to the Consultant within four (4) weeks of receipt.

- d) **Detailed Engineering Design Report (Task 3):** within eight (8) weeks after acceptance of the **Preliminary Engineering Design Report**, the Consultant is required to submit the **Detailed Engineering Design Report**, including the drawings, final costs and the EMP, and make a presentation to the Client/MOTW.

The Client/MOTW should forward comments on the report to the Consultant within two (2) weeks of receipt.

- e) **Final Bid Document (Task 4):** within two (2) weeks after acceptance of the **Detailed Engineering Design Report**, the Consultant is required to submit his portion of the final bid document including construction drawings, BOQ (blank and priced) and technical specifications to the Client. The Consultant will make himself available throughout the procurement process to advise and respond to queries arising out of the design (Section 5.4(b) – Task 4).
- f) **Design Completion Report (Task 5):** The Consultant is required to submit, within 4 (weeks) after acceptance of the Final Bid Document, the Design Completion report as per Attachment C.

PHASE 2

- g) **Pile Inspection and Supervision Report (Task 6):** The Consultant will provide a pile inspection and supervision report two (2) weeks after the completion of the construction works.
- h) **Monthly Construction Progress Reports:** Preparation of detailed monthly reports on the progress of the design and construction, indicating any engineering difficulties affecting efficient and timely execution, commencing one month after the start date as defined in the contract.
- i) **Quarterly Financial reports:** Preparation of a detailed financial report on the project, including all variations, cash flow, payments and projected final cost of the project.
- j) **Project Data -** All data collected and created throughout the duration of the project, should be submitted in digital form (all shape files and corresponding metadata, etc).

Four (4) hard copies and one (1) CD copy of all reports are to be submitted to the Client. Drawings are to be submitted on 36" x 24" paper and in AutoCAD format on CD/DVD.

8. WORKING TEAM MINIMUM REQUIREMENTS

Firms should have experience in harbor, wharf, jetty and/or coastal works design with at least two successfully completed similar assignment during the past five (5) years. Firms should have qualified professional staff in the following areas: Civil/Coastal Engineering, Environmental Engineering (CE), Land Surveyors, and Quantity Surveyors.

Regional or developing country experience, as well as climate change adaption interventions will be an advantage.

The key experts required for the Consultant's team and their minimum qualifications and experience are as follows:

WORK TEAM MINIMUM REQUIREMENTS

Position	Qualifications	Experience
Project Director	BSc. in Civil Engineering plus post grad study in related field.	Advisor, Consultant or management positions in development of projects related to harbor, wharf, jetty and or coastal works. Experience not less than 15 years with at least four projects (design and Supervision of harbor, wharf and/or jetty) and at least (1) with the Caribbean region.
Geotechnical Engineer	BSc. in Geotechnical Engineering	Experience in foundation design and pile calculations. Experience not less than 10 years with at least one (1) project (design of harbor, wharf and/or jetty) and experience in the Caribbean region.
Coastal Engineer	BSc. in Civil Engineering plus MSc in Coastal Engineering	Specialist in coastal defense and wave climate assessment. Experience not less than 10 years with at least one (1) project (design and Supervision of harbor, wharf and/or jetty) and experience in Caribbean region.
Structural Engineer	BSc. in Civil Engineering	Experience in wharf and jetty design, quantities, costings and bidding documents. Experience not less than 15 years with at least two (2) projects and experience in Caribbean region.
Land Surveyor	Licensed Surveyor or BSc in Land Surveying	At least 8 years as lead surveyor with experience in bathymetric surveys preferable. At least one (1) project

		and experience in Caribbean region.
EIA Specialist	BSc. in Natural Sciences or related field	At least 10 years experience in coastal and terrestrial environments with experience in the Caribbean on a similar project.
Quantity Surveyor	BSc. in Quantity Surveying or Cost Engineering	At least 10 years experience in civil and building works and familiar with CESMM 3. At least two (2) projects of similar nature and experience in the Caribbean region.
Pile Inspector	Engineering Diploma	At least ten years in civil works including on shore and offshore piling operations. At least three (3) projects of similar nature and experience in the Caribbean region

The firm must select and hire other experts as required according to the profiles identified in the Organisation & Methodology and/or these TOR. All experts must be independent and free from conflicts of interest in the responsibilities they take on.

During the evaluation, particular attention will be given, in assessing the Organisation & Staffing proposal for phases 1 and 2, to the recruitment of the following non-key experts with the adequate number of days: (i) **Social and Environmental Specialist, and GIS** (Phase 1); **Clerk of Works** (if so planned by the Consultant for phase 2).

ATTACHMENT A

Design Brief

Introduction

The Chateaubelair jetty (located in the town of Chateaubelair on the North Leeward coast) was destroyed during the December 24, 2013 storm event. No investigation has yet been undertaken, but it is assumed that the torrential flows in the Chateaubelair River that discharged into the bay just south of the jetty, created currents sufficiently strong, that in combination with either under design, age or poor workmanship, caused the jetty to collapse. The jetty was the only significant one in the central and north leeward area and apart from commercial activity, provides a location for both the delivery of emergency supplies and evacuation. The old jetty lies on the seabed.

Site Assessment

The jetty is located 13degrees 17 minutes 29.17 seconds North and 61 degrees 14 minutes 26.49 seconds West, in Chateaubelair Bay.



Figure 1 Location of Chateaubelair Bay



Figure 2 Area Map of Chateaubelair Bay

The bay faces a generally northern direction (NW) and is sheltered from the east and south. The jetty is located approximately 80 meters to the East of the mouth of the Chateaubelair River and about 680 meters South West of the Fitz Hughes River mouth. Hydrology studies in 2006 estimated 1 in 25 yr maximum flows in these rivers at $41.53 \text{ m}^3/\text{sec}$ and $68.83 \text{ m}^3/\text{sec}$ respectively.

The foreshore along the bay is sandy and gently sloping. The beach front area of the bay is approximately 1.2km long, with the sandy foreshore widening to the western end of the bay.

Recently completed studies (November 2013) on the wave climate in the adjacent bay (Dark View to the West) show that the daily wave climate is characterized by wave heights ranging between 0.25m and 0.5m throughout the year with occasional maximums between 0.75m and 1.25m. The 1 in 150 year return period storm waves range between 1m and 4m in the near shore with static storm surge in the near shore up to 2.4m. The waves in Dark View are generally from a Northerly direction.

The population in the Chateaubelair Bay area is approximately 3,200 persons. Agriculture and fishing are the two main economic activities. There is a small hydroelectric plant in Fitz Hughes producing approximately 1 MW of power.

User Requirements

The user requirements of the jetty will be based on fishing activities, minor commercial activities and emergency evacuation and supply operations.

These latter emergency activities are relevant in light of the nearby volcano at Mt Soufriere and the vulnerability of the connecting road and bridge infrastructure to Chateaubelair, in storm events. The volcano last erupted in 1979 and the most recent storm event on 24th December 2013, cut off road access to the area for three days. A major bridge over the Cumberland River (Spring Bridge) barely survived, which if destroyed, would have resulted in severe and prolonged traffic disruption. The jetty therefore should provide for the docking of a Ro-Ro vessel such as those presently used between the mainland and the Grenadines to cater for an emergency situation.

The small fishing vessels commonly used in the area should be catered for with a low landing facility to allow easy offloading of catch and equipment.

The jetty strength must cater for the off loading of construction equipment such as excavators, bulldozers, etc.

Light poles for night time activity will be required.

A fender system appropriate to low level usage and minimum maintenance should be provided.

Metal bollards will be placed at appropriate locations.

A 2 inch water supply line should be provided along the main leg of the jetty.

The jetty should provide for a major berthing location and at least one secondary location other than the low landing for the small fishing vessels.

The preferred configuration of the structure is an “L” shape. This however will be finalized following bathymetric, wave climate and other relevant considerations.

Design Requirements

General

The design of the structure shall take into account, stability, strength, serviceability, durability and redundancy. The design shall be carried out in accordance with appropriate British and American Standards or approved equal.

Standards

The design standards to be used for the design of elements of the structure will include the following or approved equal:

BS8110 – Structural Use of Concrete
ASCE 7 – Wind Loads
SEAOC – Earthquake loads
BS 8004 – Foundations
BS6349 – Design of maritime structures

Stability

The structure and its component elements shall be designed for both static and dynamic stability under overturning, vertical and horizontal forces. Worst case combinations of design forces shall be considered to ensure that structural resistance exceeds the imposed loads.

Strength

The structure and its elements shall be designed for strength in accordance with appropriate Standards together with the requirements of this document as follows:

- (a) Determine the appropriate dead and live loads
- (b) Combine and factor the loads to establish the design forces on the structure.
- (c) Determine the worst case effect of the design loads on the component elements of the structure
- (d) Determine the design strength required for the various component elements.

The effects of fatigue from wind, wave and current action under normal conditions shall be considered along with the effects of hurricane conditions.

The design wave return period shall be determined in accordance with Section 5.2 Task 2(f)

Serviceability

The structure and its elements shall be designed for serviceability by controlling or limiting settlement, horizontal displacement and cracking.

Under the appropriate load combinations for serviceability design, vertical deflection shall be limited in accordance with the requirements of the appropriate material and design standards.

Durability

The structure and its elements shall be designed for durability with the use of appropriate material and workmanship specifications and the recognition of hurricane events.

The Consultant shall pay special attention to corrosion resistance in his design and incorporate such techniques so as to mitigate deterioration via this process.

Redundancy

Consideration should be given in the design of the structure and its elements, to allow for redundancies to prevent failure of the structure in the event of the loss of a major element.

Design Life

Design life is the period of time for which a structure or an element of the structure remains fit for use for its intended purpose with appropriate maintenance. It is recommended that a minimum design life of 50 years be adopted for this structure.

Design life should be based on consideration of capital and maintenance expenditure. The designer, in consultation with the client will determine an appropriate maintenance regime consistent with the adopted design and materials that will achieve the design life.

Particular care will be taken when considering design life and maintenance regimes for inaccessible elements of the structure. Such elements should have a design life (with no maintenance) equal to the design life of the structure.

At the end of its design life, the structure should have adequate strength to resist ultimate loads and be serviceable, but may have reached a stage where further deterioration will result in inadequate structural capacity.

Scour and Siltation

The structure and its elements shall be designed to remain stable, of sufficient strength and not become over-stressed in the event of temporary or permanent changes in the level of the seabed due to scour or siltation.

This design consideration is particularly important given the possible failure mode of the previous structure in this location which is located just east of the mouth of the Chateaubelair River. It is postulated that a possible cause of failure following the December 2013 floods was the scouring of the sea bed around inadequately embedded piles.

Sea Level Rise

Structures shall be designed to allow for future sea level rise caused by the impact of climate change.

Proposed Investment

Prior to the jetty destruction, the jetty was L shaped with the landside section approximately 140 feet long 15 feet wide running NNW and the berthing leg about 46 feet long and 22 feet wide running WSW. The picture below shows the remaining 30 feet (approximately) of the landside section. The damaged jetty lies on the sea bed beyond the blue boat.

The Consultant will advise, following the design process outlined in Section 5 of the TOR, on the best geometry and alignment and structure to adopt going forward.

The estimated cost of the proposed investment is USD 1.5 million



Landside remains of destroyed jetty at Chateaubelair

ATTACHMENT B

Inception Report Template

The Consultant is free to format the Inception Report to his normal presentation, but the report shall contain the following minimum content:

- Executive Summary
- Introduction
- Background and description of various project elements
- Understanding of project objectives
- Contract signing and project commencement
- Team mobilization and project activities to date
- Data collection
- Data gaps
- Assumptions, Risks and Mitigation Strategy because of data gaps
- Comments on TOR
- Design criteria and codes
- Project Organisation / Lines of communication
- Project execution, methodology and scheduling
- Proposed outlines for interim and final reports
- Appendices e.g. meeting details, Organisation Chart, TOR, photographs, etc.

ATTACHMENT C

Final Design Completion Report Template

The Consultant is free to format the Final Completion Report to his normal presentation, but the report shall contain the following minimum content:

- Title Page
- Table of Contents
- Acknowledgements
- Executive Summary
- Background
- Aims and Objectives
- Methodology (including codes and standards used)
- Implementation
- Outputs and Results (including designs and design calculations)
- Outcomes
- Bid evaluation report (including arithmetic review of the bids)
- Conclusions
- Recommendations
- Lessons learned
- References
- Appendices

ATTACHMENT D

Terms of Geo-Spatial Data Delivery and Sharing

Freely accessible data and analysis is a core component of this project. Therefore, all geospatial data collected and created by project activities must be preserved, consolidated and transferred to the Government of Saint Vincent and the Grenadines and the World Bank upon project completion, in a well-known or standard electronic format. Specifically the following terms apply:

Licensing: All data procured and developed for this project is done on behalf of the Government of Saint Vincent and the Grenadines and the World Bank and therefore all licensing agreements must be made similarly. In keeping with the World Bank commitment to open data, it is recommended that this license be under Creative Commons CC-BY-SA where possible and appropriate. See: <http://creativecommons.org/licenses/by-sa/2.0/> for more detail.

Vector data: Geospatial vector data must be converted into a standard OGC format or well-known format. This list includes, but is not limited to, shape file format. Additional formats may be delivered with prior approval. All files must include projection parameters. Vector data must adhere to topological standards.

Raster data: Geospatial raster data must be converted into a standard OGC or well-known format. This list includes, but is not limited to, GeoTiff format. Additional formats may be delivered with prior approval. All files must include projection parameters.

Tabular data: Tabular data must be converted into a readily accessible or well-known format. This list includes, but is not limited to, CSV, tab delimited text file, or spreadsheet. Additional formats may be delivered with approval.

Media/method of transfer: All data sets must be transferred on permanent media such as a CD/DVD disk. Very large data sets, too large for CDs and DVDs, may be provided on a hard drive or solid-state drive, as agreed by the Government of Saint Vincent and the Grenadines and the World Bank.

Metadata: Detailed documentation needs to be provided for each data set. This metadata must include description, source, and contact, spatial and attribute keywords, date, accuracy, restrictions. A description of attributes should be provided for vector and tabular data sets. Spatial data must include details of projection. The World Bank has created metadata standards for internal use, based on ISO 19115:2003, that meets these requirements. Please refer to World Bank metadata standard for details. The metadata standard to be used in this consultancy will be discussed with the involved ministries and the responsible for the National Spatial Data Infrastructure.

Derived data: All derived data generated for this project belongs to the Government of Saint Vincent and the Grenadines and the World Bank and must be transferred under these terms.

Periodic updates: Ongoing updates of this data made by the selected must be provided as they are created.

Disposal of data: The selected firm is free to maintain copies of data collected and developed through this project, without conflicting the terms of any license agreements. Ownership remains with, and must be stated as, the Government of Saint Vincent and the Grenadines and the World Bank. Further data sharing is permissible under these terms only if the data is made freely available without cost.

CARTOGRAPHIC STANDARDS

British West Indies (BWI) Grid parameters

Grid	British West Indies
Projection	Transverse Mercator
Spheroid	Clarke 1880
Datum	St. Vincent
Unit of measurement	Metre
Meridian of Origin	62° West of Greenwich
Latitude of origin	Equator (0°)
Scale factor at origin	0.9995
False Coordinates of Origin	400000 Easting
	Nil Northing

Universal Transverse Mercator Zone 20

Grid	UTM Zone 20
Projection	Transverse Mercator
Spheroid	WGS 1984
Datum	WGS 1984
Unit of measurement	Metre
Meridian of Origin	63° West of Greenwich
Latitude of origin	Equator (0°)
Scale factor at origin	0.9996
False Coordinates of Origin	500000 Easting
	Nil Northing

