

VOLCANIC ERUPTION EMERGENCY PROJECT (VEEP)

Terms of Reference

**For the Consultancy Services
Site 1: Design & Supervision for
Reconstruction and Repairs to Waterloo #3 Road
Site 2: for Design review & Supervision for Reconstruction and Repairs to Jennings
Mountain Road and River Fords**

**Ministry of Finance, Economic Planning and Information Technology
Economic Planning Division
Kingstown,
Saint Vincent and the Grenadines**

June 2022

TERMS OF REFERENCE

BACKGROUND

The Government of Saint Vincent and the Grenadines (GoSVG) has received financing from the World Bank under the Volcanic Eruption Emergency Project (VEEP) to support the post eruption recovery activities. This activity is funded through the VEEP.

With the volcanic eruptions of the La Soufriere came significant damage to main and feeder roads, particularly in the northern parts of the island “Red Zones”. Several roads and road networks were identified in North Windward for reconstruction and repairs based on the 2021 priority assessment conducted by MoTW and BRAGSA using the criteria of location and function, safety, rigidity, traffic volume and level of damage. Two of the roads assessed were:

Site No.1 - Waterloo #3:

High on the priority list of roads to be reconstructed is the Waterloo #3 road with a length of approximately 0.53km. This deteriorated asphalt feeder road provides access to The Caribbean Agricultural Research and Development Institute office (CARDI), the North Windward Agricultural and Livestock Station and to approximately 50 farmlands.

Site No.2 - Jennings Mountain Roads and Fords:

Jennings road is 1.1km of damaged, partly asphalted, partly concreted feeder road with four river crossings that are in need of immediate rehabilitation. This road is of extremely high priority as it leads to the CWSA Water Intake and approximately 20 farms that are predominantly cocoa farms which supply raw material the St. Vincent Cocoa Company. The road also provides access to four well known Eco-Tourism Sites one of which is the Congo Valley Recreational Site.

OBJECTIVE

The objective of the proposed consultancy is to provide technical support to the Ministry of Finance, Economic Planning and Information Technology, Kingstown, St. Vincent for the preparation of the detailed designs, specifications, bills of quantities, preparation of bidding documents and construction supervision of civil and infrastructure works during the construction and defects liability periods for Site 1 (Waterloo #3) and Site 2 (Jennings Mountain Road and Fords).

DURATION

It is expected that the consultancy will last a period of sixty (60) weeks to produce the deliverables listed under the section of reporting requirements (including the construction and defects liability periods). Design period should not exceed 12 weeks, construction supervision for Site 1 for an estimated 20 weeks, construction supervision for Site 2 for an estimated 48 weeks. The overall construction supervision should not exceed 48 weeks.

GENERAL REQUIREMENTS

The EPD as the client, will be contractually responsible for the consultant's assignment, however, the consultant will work closely with the MoTW, who will serve as the clients contract technical representative. The consultant will be responsible for carrying out pre and post contract services to ensure compliance with the approved engineering designs, bills of quantities, and technical specifications for all civil works in accordance with acceptable international design standards and engineering codes of practice.

It is understood that the consultant will provide all the necessary technical and support staff to administer, manage, and supervise the project and fulfil the requirements of the EPD, according to the drawings and contract documents. The consultant will also carry out any additional services, which the client may reasonably require, relating to the design and supervision of the project.

To ensure adequate project management and the implementation of agreed quality assurance/quality control procedures, the consultant must include in the technical proposal, a suitable Design Review and Construction Supervision Management Plan and Programme emphasizing project organisations, set up to meet its budget and schedule objectives, resources management, environmental and social, traffic and safety administration, engineering value analysis, performance and critical path planning and monitoring, and project reporting systems.

The consultant will liaise closely with the EPD 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 documented and a log kept of all such communications

SCOPE OF SERVICES

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 and Post 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 this Terms of Reference (ToR).

The services will include an environmental and social study and the recommended options for road reconstruction and repairs to Waterloo #3 Road and Jennings Mountain Road and Fords. It will also include: (a) detailed cross-section of road and drainage designs and prepared technical specifications and the bills of quantity; and (b) Supervision of works during the reconstruction period, input during the defects liability period, and the preparation and submission of reports.

Site 1- Waterloo #3 Road

Design Requirements

General

The scope of geotechnical investigations, if required, is not anticipated to exceed visual observations, sieve analyses and DCP tests.

In addition to the parameters outlined in Appendix C, the Consultant will assess the proposed intervention in this area.

Standards

The design standards to be used for the road, should follow the following Transport Research Laboratory (TRL) standards for tropical countries:

ORN 6 – A guide to geometric design

ORN 16 – Principles of low cost engineering in mountainous regions

ORN 31 – A guide to the structural designs of bitumen surfaced roads in tropical and sub-tropical countries

Strength

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

- (i) estimating the amount of traffic and the cumulative number of equivalent standard axles that will use the road over the selected design life. The MoTW has conducted traffic counts in the area and will make this information available.
- (ii) assessing the strength of the subgrade soil over which the road is to be built. This will require DCP testing and sieve analysis.
- (iii) selecting the most economical combination of pavement materials and layer thicknesses that will provide satisfactory service over the design life of the pavement (It is usually necessary to assume that an appropriate level of maintenance is also carried out). The Consultant, along with discussions with the

- engineers in the MoTW, will assess the material type and availability on the island, for use in the road construction.
- (iv) carry out cost analysis with respect to road structure and road width choices.

Serviceability

The Consultant is expected to consider all the design elements outlined in Appendix C. Some considerations for serviceability such as ensuring a good riding surface, suitable road width, safe curve radii, adequate roadside drainage, protection to areas vulnerable to slippage and safe lines of sight, are discussed below.

The wearing course on the existing road has 0.53km of asphalt. The asphalt surface is in poor condition. and is expected to be resurfaced throughout.

The existing asphalt width averages twelve (12) feet. The final design is expected to maintain this minimum width plus a two (2) foot gravel shoulder on the side opposite to the roadside drainage. Where constraints arise, slipper drains with extended widths to accommodate traffic (as opposed to box drains) should also be considered as a means to reduce road hillside embankment excavations.

With respect to laybys, every opportunity should be taken to develop laybys where the existing road cross section widens naturally or can be widened with minimal effort.

There are existing drainage structures along the road. Slipper drains are to be provided throughout, as necessary. The Consultant shall also recommend swales if deemed appropriate.

Safe lines of sight shall be provided. This will require embankment excavation which the Consultant will consider in the design.

Durability

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

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 10 years be adopted for this road.

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.

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.

PHASE 1: Preparation of Design and Bidding Documents.

Task 1: Data Collection and Analysis of the site.

The area of study is captured in the pictures in Annex1. The investigation and analysis of the subject area will entail field, laboratory and desk reviews.

The field investigation will include topographic and geotechnical surveys aimed at characterising the surface and sub-surface nature of the site. The field investigation will also include the screening of land ownership and use patterns at the site to determine potential involuntary resettlement/land acquisition/economic displacement impacts, as detailed in the VEEP Resettlement Policy Framework (RPF). The consultant shall liaise closely with the Client's Social Safeguards Specialist to ensure this is carried out satisfactorily.

Task 2: Conduct Environmental, Social and Topographic studies.

A topographic survey shall be carried out to produce accurate contours in the proposed areas of design. It is expected that the area surveyed at the site would include existing roads, drains and vertical relief. The consultant will also survey other areas that are considered to be necessary for the design of the road and prepare site investigations reports that entail the analysis of the subject areas based on topographical surveys.

An integral part of the design process will be an Environmental and Social Impact Assessment (ESIA) related to the proposed construction work. The ESIA shall solicit and include comments from the public/stakeholders regarding the road reconstruction and the operational requirements as viewed by the stakeholder users. The consultant will carry out this ESIA in accordance with the Environmental Management and Social Framework (EMSF) developed for the project by the GoSVG /World Bank to assess the environmental and social impact and mitigative measures for various interventions.

The objective of the ESIA is to assist with the selection of the most appropriate engineering solution that will minimise environmental impact, and develop an Environmental and Social Management Plan (EMSP) to guide construction practice. The Client and the MoTW shall have 14 days to provide comments. The consultant shall incorporate comments received and prepare a draft ESIA 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) public meeting in the project area to present the findings of the ESIA and to solicit comments. A record of these meetings shall be kept and comments received shall be documented and incorporated in the final ESIA. Following the public consultation, the consultant shall have 14 days to incorporate comments received and shall deliver the final ESIA to the Client.

It is anticipated that the ESIA results in an EMSP. The BoQs shall include line items to cater for the pricing of the relevant EMSP activities.

The preliminary design report is also expected to contain preliminary design drawings and cost estimates.

In accordance with World Bank OP 4.12, and as detailed in the VEEP Resettlement Policy Framework (RPF), the consultant shall also screen for and seek to avoid in the design, potential involuntary resettlement/land acquisition/economic displacement impacts. The consultant shall liaise closely with the Client's Social Safeguards Specialists to ensure this is carried out satisfactorily.

Task 3: Preliminary Design

Based on the activities under the previous tasks, Task 3 will comprise those activities required to present a preliminary design for the proposed sites. The preliminary design output will be documented in a report.

The preliminary design is expected to include the following drawings, but it is not limited to:

- Topographical site plan
- Road cross-section
- Drains cross-sections.
- Ford cross-section and longitudinal profile (if any)

Task 4: Detailed Engineering Design

- a. Following approval by the Client, the consultant shall proceed to complete the final detailed engineering documents and technical specifications for the site.
- b. The consultant is expected to prepare the detailed BoQs and more reliable engineering estimates based on the detailed design of the civil works. Current costs for similar works in Saint Vincent and the Grenadines will be used as a basis for all unit rates and cost estimates.
- c. The consultant will finalize an EMSP based on the selected intervention for inclusion in the BoQs.
- d. The consultant shall be responsible for making a presentation of the draft final report to the Client/ MoTW.

Task 5: Bid documentation and Procurement

The Client shall prepare the bidding documents. The consultant will assist in the preparation of the bidding document including:

- a. Provide construction drawings, BoQs and technical specifications to the Client.
- b. Provide advice to the Client during the procurement process, including bid invitation wording, attendance at the pre-bid site meeting, clarifications on queries received from the bidders, preparation of the bid evaluation report and recommendation for contract award in accordance with Bank's procurement guidelines.

Task 6: Final Design Report

The consultant will provide a final design report.

Site 2- Jennings Mountain Road and Fords

PHASE 1: Review Services

The objective of the proposed consultancy is to provide technical support to the Ministry of Finance, Economic Planning, and Information Technology, for the design review and construction supervision for the Jennings Road. The designs were completed under different funding arrangements from this consultancy and can be accessed via the following link.

<https://drive.google.com/file/d/1AALV2Mz2b1YTIYh1Y0ZxVsvI6r8Liy0c/view?usp=sharing>

Task 1: Data Collection and Site Assessments.

The investigation and analysis of the subject area will entail field and desktop studies.

The field investigation will include site visits and miscellaneous topographic surveys, geotechnical surveys and soil tests, all aimed at characterizing the surface and sub-surface nature of the site. The extent of these activities is at the Consultant's discretion, based on his assessment of the designs under review.

Relevant field data will be collected to analyze the environmental impact of proposed interventions. An Environmental and Social Impact Assessment (ESIA) will be carried out in accordance with the Environmental and Social Management Framework (ESMF)

In accordance with World Bank OP 4.12, and as detailed in the VEEP Resettlement Policy Framework (RPF), the consultant shall also screen for and seek to avoid in the design, potential involuntary resettlement/land acquisition/economic displacement impacts. The consultant shall

liaise closely with the Client's Social Safeguards Specialists to ensure this is carried out satisfactorily.

For the Jennings Mountain Road and Fords, the scope of geotechnical investigations if required is not anticipated to exceed visual observations, sieve analyses and dynamic cone penetrometer (DCP) tests. This road crosses four (4) streams using concrete fords and a culvert that needs to be replaced.

Task 2: Desktop Review

Desktop activities for both roads will include a review of existing design drawings, specifications, design briefs, records and maps on geology and rainfall. Additional information if required shall be obtained from:

Ministry of Transport, Works, Land and Surveys, and Physical Planning
Ministry of Agriculture, Forestry, Fisheries
National Emergency Management Organization
Ministry of Housing, Informal Human Settlements,
Central Water and Sewerage Authority – Water Resource Management Unit

In addition to the above-mentioned agencies, the Consultant shall identify other sources and review the information as required.

Task 3: Final Designs

Based on Task 1 and 2 activities, Task 3 will comprise of those activities required to present a final design. The designer on record will be the original designer. As such, the Client will facilitate any communication required to effect suggested changes.

Task 4: Bid documentation and Procurement

The Client shall prepare the bidding documents. The consultant will assist in the preparation of the bidding document including:

- a. Provide construction drawings, BoQs and technical specifications to the Client.
- b. Provide advice to the Client during the procurement process, including bid invitation wording, attendance at the pre-bid site meeting, clarifications on queries received from the bidders, preparation of the bid evaluation report and recommendation for contract award in accordance with Bank's procurement guidelines

PHASE 2: Construction Supervision Site No. 1 and Site No.2

Task 1: Supervision

The MoTW will have technical oversight responsibilities on the project, but the Consultant will be responsible for the following activities:

- a. Advising the Contractor on the interpretation of the drawings and technical specifications and issue supplementary details and instructions during the construction period, as required;
- b. Reviewing the Contractor's construction schedule and commenting on the procedures, methods and sequence of the works;
- c. Reviewing working drawings and ensuring the preparation of final as-built drawings;
- d. Writing the supervision monthly progress reports and making comments on the physical and financial progress achieved during the month;
- e. Review the contractor's monthly progress reports, make comments and recommend any appropriate action as required.
- f. Considering and advising on alternative methods, equipment and materials proposed by the Contractor;
- g. Advising on the validity of charges for additions or deletions to the contract and on the issuing of change orders;
- h. Processing Contractor's interim and final payments and prepare progress certificates for the Client's acceptance;
- i. Maintaining detailed records related to the contracts;
- j. Arranging and chairing regular site meetings and recording and reporting on the proceedings;
- k. Providing advice to the Client during construction on planning and scheduling, budgeting, estimating, and cost and quality control;
- l. Establish, monitor and enforce quality assurance/quality control procedures on contracts.

Resident Services During Construction – the Consultant will be required to:

- a. Provide full-time resident staff services during construction. This will comprise of at least one (1) Engineer and one (1) Clerk of Works for each site;
- b. Ensure that the Contractor is carrying out the work in accordance with the contract documents and communicate with the Contractor and the Client regarding deficiencies in the work and other matters of direct interest or concern;
- c. Check Contractor's line and grade;
- d. Monitor and report on the Contractor's compliance with the Environmental Management Plan (EMP);
- e. Arrange for all necessary field testing and inspection and provide approvals of materials installed in accordance with test results;
- f. Monitor all concrete pours;
- g. Investigate and report on all unusual circumstances that may arise during construction;
- h. Carry out a final inspection at the conclusion of the construction contract as part of the acceptance program of the Client;
- i. Obtain field information of construction details from the contractor, for the modification of contract drawings by the Consultant to show the work "as-built";
- j. Provide comprehensive report and recommendation on any claim/dispute arising out of the contract; advise the Client throughout the mediation, adjudication and arbitration process during the currency of the contract.

Task 2: Post Construction Services

- a) Prepare the "as-built" drawings of the works.
- b) The Consultant shall visit the site at least twice during the maintenance period to determine deficiencies during the contract defects liability period, issue written instructions regarding repairs, monitor the rectification of deficiencies, and prepare final acceptance documentation at the expiration of the defect liability period.
- c) Prepare a Project Completion Report on the construction contract, including as-built drawings and any useful lessons learned from the construction experience.

INPUTS

The Client:

- a. Review and have access to all plans, pictures, reports, topographical surveys, etc. of the proposed works that might be necessary and applicable in the execution of the work required under this TOR.
- b. Review correspondences between the Consultant and the Contractor as necessary and provide input if required.
- c. Have access to the project sites
- d. Provide liaison with other ministries, departments, and authorities, etc. in order to introduce the consultant. The consultant however shall be fully responsible for collecting data, information, etc. from these agencies
- e. Assign staff to the consultant for the purpose of knowledge transfer in the various aspects of the assignment.
- f. 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 Saint Vincent and the Grenadines for the purpose of carrying out the services.
- g. The Client /MoTW may 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

The Consultant:

The Consultant will provide the 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.

REPORTING REQUIREMENTS

Note: all Final hard copy reports shall be bounded with a transparent protective cover and cardboard paper backcover. The project information, consultant details and title of the report should be visible through the protective front cover. All Final electronic copies of reports shall be in pdf unless otherwise stated. All electronic copies of drawings shall be submitted to the client in AutoCad format. Hard copies for use by the Contractor shall be provided on 11 x 17 paper.

The Consultant shall submit the following to the Client's satisfaction:

- a) **Inception Report:** within two (2) weeks of signing of the contract, the Consultant is required to submit an Inception Report. A typical sample template is attached in Appendix B.

The EPD should forward comments on the report to the consultant within two (2) weeks of receipt

- b) **Draft Environmental and Social report** for review: within within three (3) weeks of signing of the contract
- c) **Design Review Report:** Within four (4) weeks after acceptance of the Inception Report, the Consultant is required to submit a Draft Design Review Report. The Consultant will present this report in both hard copy (4 copies) and an electronic word copy.

The Client will forward comments on the report to the Consultant within two (2) weeks of receipt. Once the comments have been incorporated into the report the consultant shall submit a Final Design Review Report within one week of receiving the client's comments. This Final Design Review Report shall be submitted in both hard copy (4 copies) and an electronic pdf copy.

- d) **Construction Supervision:** The Consultant is expected to provide on a monthly basis, construction progress reports which includes environmental monitoring and Social matters, progress certificates and Contractors Interim Payment claims, contractual correspondence, minutes of meetings and technical construction correspondence.
- e) **Post Construction:** The Consultant shall issue whatever necessary written instructions are required regarding repairs arising out of poor workmanship and issue the final certificate. Additionally, a Project Completion Report shall be issued within three (3) months of the expiration of the maintenance period.

A Project Completion Report shall be issued within three (3) months of the expiration of the maintenance period. The report shall address all aspects of the project implementation, including financial summaries, suggestions and recommendations for future design and construction methods, technical specifications, any changes in Special Conditions of Contract and photographs.

Four (4) hard copies and one (1) electronic copy of all reports are to be submitted to the EPD. Drawings are to be submitted on 11" x 17" paper and in electronic AutoCAD (2010) format.

WORKING TEAM MINIMUM REQUIREMENTS

In estimating man-month requirements and cost of the services, the Consultant should ensure that the proposal takes full account of all of the above requirements and the following items:

- Consultant's remuneration
- Consultant's out of pocket expenses
- Consultant's housing accommodation
- Support staff services
- Equipment rental
- Communication costs
- Ground and airfare transportation
- Report reproduction costs
- Contract documentation costs
- Supervision costs
- Surveys
- All applicable direct and indirect local taxes

WORK TEAM MINIMUM REQUIREMENTS

Position	Qualifications	Specific experience
Project Manager	BSc in Civil Engineering plus postgraduate study in the related field.	Advisor, consultant or management positions in the development of projects related to road, bridge and river flood protection works. Experience not less than 15 years.
Road Engineer	BSc in Civil Engineering	5 years of experience in road design; experience in rural/mountain locations will be advantageous.
Resident Engineer	BSc in Civil Engineering	8 years site experience in road, bridge and general civil works.
Land Surveyor	Licensed Surveyor or BSc in Land Surveying	At least 8 years of experience as a lead surveyor with experience in road surveys is advantageous.
Quantity Surveyor	BSc in Quantity Surveying	At least 5 years experience in civil and building works and familiar with the use of the Civil Engineering Standard Method of Measurement (CESMM)

The firm shall select and hire other experts as required according to the profiles identified in the TOR. All experts must be independent and free from conflicts of interest in the responsibilities they are undertaking

APPENDIX A

North Windward Feeder Road

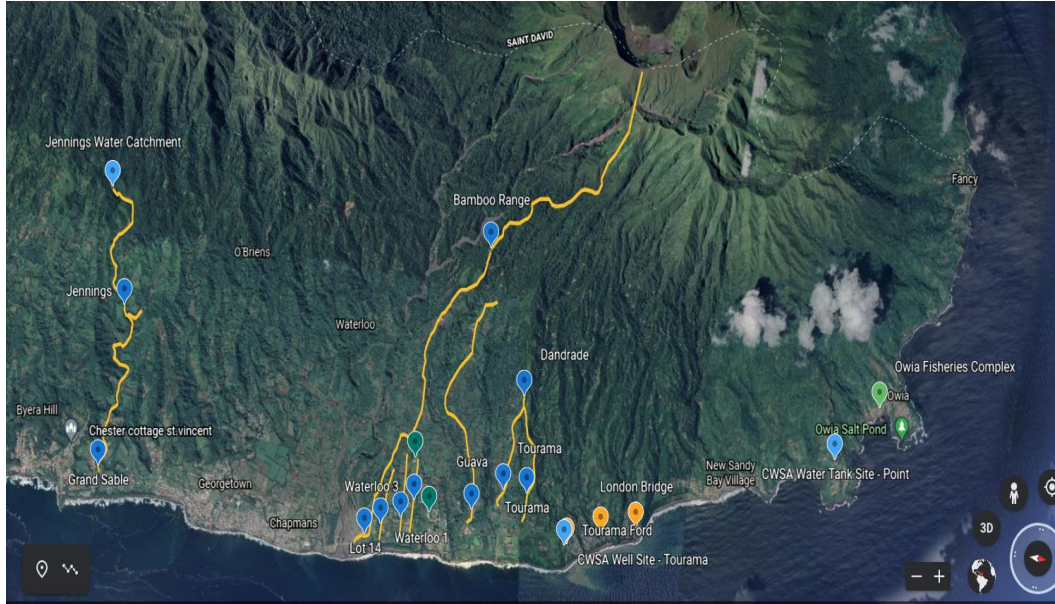


Figure 1. aerial view of the roads network road networks identified in North Windward for reconstruction and repairs based on a priority assessment conducted by MoTW and BRAGSA

Waterloo #3 Road



Figure 2. Photo showing the start of waterloo #3 road (0+000)



Figure 3. Photo showing road section of Waterloo # 3 road (0+412).



Figure 4. Photo of a river crossing along the Jennings Mountain Road +930



Figure 5. Photo of a river crossing along the Jennings Mountain Road 1+060



Figure 6. Photo of a section along the Jennings Mountain Road +875

APPENDIX B

Inception Report Template

The Inception 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, codes and guidelines
- 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.

APPENDIX C

Design Review Report

The Design Review Report shall be guided by the following general philosophical considerations:

- Do the data and results support the final design?
- Do the assumptions seem reasonable?
- Are there areas where the risks appear to be higher than normal?
- Are there items of significance that have not been addressed?
- Are the design methods used appropriately for this road and its intended use?
- What problems remain to be solved?
- Can the design be constructed?
- Are the contract documents satisfactory to proceed to construction?
- Does the design meet the environmental requirements?
- Does the design minimize maintenance requirements?

The Consultant is reminded that the review is intended to produce a professional assessment of the adequacy of the design approach, its execution, and the documentation. As such, he will evaluate the construction documents to determine whether the designs appear complete, consistent, and in general compliance with relevant codes and design requirements as stated in the TOR.

The consultant is reminded that the review is intended to produce a professional assessment of the adequacy of the design approach, its execution, and the documentation. As such, he will evaluate the construction documents to determine whether the designs appear complete, consistent, and in general compliance with relevant codes and design requirements as stated in the ToR

The report shall include the Consultant's checklist of items reviewed, a sample of which is provided below.

Item #	Design Component	Satisfactorily Covered in Design Yes / No	Comments
1	Subgrade strength		
1a	Base Course		
2	Design speed		
3	Design Traffic		
4	Design Vehicles		

5	Traffic Control Plan		
6	Environmental considerations		
7	Crest Sight Distance		
8	Sag sight distance		
9	Superelevation		
9a	Vertical alignment		
10	Horizontal alignment		
11	Pavement type		
12	Pavement width		
13	Lay Bye		
14	Cross slope		
15	Pavement calculations		
16	Shoulder details		
17	Side slopes		
18	Barriers		
19	Retaining walls (RC, Gabions, block, other)		
20	Intersection design		
21	Design storm frequency		
22	Hydrology		
23	Roadside drainage		
24	Culverts		
25	Bridge (abutments, deck, wing walls, span, location etc)		
26	General excavation		
27	Property access		
28	Utilities		
29	Miscellaneous Structures		
30	Drawings		
31	Signage		
32	BOQ and cost estimate		
33	Specifications		