# **DRAFT TERMS OF REFERENCE**

# **BACKGROUND**

The Soesdyke-Linden Highway is a rural arterial highway which runs between Soesdyke, Region 4 and Linden, Region 10, connecting the East Bank Demerara with the mining town of Linden. The highway is a 73-kilometer-long, two lane, asphaltic concrete surface road and includes 9 multi-span bridges and six culverts which span creeks along the route. The Soesdyke-Linden Highway is a major section of the only available land route between Guyana’s two largest towns. It also forms part of the primary link to Brazil. As such, the highway is a vital part of Guyana’s main road network.

The current pavement structure is in fair but worsening condition mainly due to insufficient periodic maintenance. Consequently, the highway requires immediate reconstruction as it may not withstand current and future traffic volumes of increased heavy vehicles carrying commercial payloads.

The Government of the Co-operative Republic of Guyana (GoG), through the Work Services Group of the Ministry of Public Works (MoPW), has initiated the process to reconstruct the Soesdyke-Linden Highway. In December 2018, a contract was awarded to Beston Consulting Limited in association with SRKN’gineering and Associates Limited to conduct a feasibility study and prepare detailed designs for the rehabilitation of the Soesdyke-Linden Highway. The consultancy project was completed in 2020 and designs are now available for the reconstruction of the highway.

The GoG has received financing from the Islamic Development Bank (IsDB) for the reconstruction works and now wishes to engage the services of a Consultancy Firm to support the timely implementation of the Project.

# **OBJECTIVES**

The objective of this consultancy is to assist the MoPW in the design review, construction supervision and general project management of the Reconstruction of the Soesdyke-Linden Highway and contract administration throughout the project implementation process and thereafter during the defects liability period.

The Consultant will also be responsible for ensuring compliance with the engineering design, technical specifications, safety standards, environmental protection measures and social safeguards. The Consultant will also be responsible for post-construction reporting.

# **GENERAL REQUIREMENTS**

1. The Consultant will report to the Coordinator, WSG through the Project Manager and will be responsible for administering the construction contract and supervising the works through a resident engineering office, applying best engineering practices to ensure quality and avert cost overruns.
2. The professional services of the Consultant should cover all the technical fields involved in the execution of the works. These responsibilities include proper implementation of all Quality Control (QC) procedures needed to verify production quality and quantity, and the Quality Assurance (QA) procedures needed for the acceptance or rejection of the Project at completion. The QA/QC procedures must assure compliance with the requirements of the Environmental Protection Agency (EPA) of Guyana, with the specifications, mitigation measures, and environmental management plan recommended in the Environmental and Social Impact Assessment (ESIA) for the project.
3. The Consultant will provide all technical and support staff needed to administer and supervise the project and to fulfil the requirements of the Contracting Agency (MoPW) according to the contract documents and to avoid cost overruns while preserving the affordable project design standards. The technical staff must include, among others, at least one qualified environmental inspector who must be on site whenever construction work is being executed. The Consultant will also carry out any additional services, which the Project Manager may reasonably require relating to the supervision of the works contract.
4. The consultant would be required to assist WSG with the evaluation and due diligence process, to confirm the civil works contractors' qualifications and ability to undertake the contract. This process should pay attention to past poor performance and low bid prices.
5. The Consultant must review the detailed engineering designs and technical specifications in order to familiarize themselves with these documents and to identify details of the works that may need revision or could present difficulties during construction. Any comments/observations resulting from this review process should be submitted in the Inception Report. The Consultant will submit two (2) copies of the Inception Report to the Coordinator, WSG within two (2) months after the commencement of the consultancy assignment.
6. Essentially, the Consultant will be required to carry out a constructability review and value engineering analysis without, however, relieving the Design Consultants of its liabilities
7. The Consultant will initiate and manage the process for the establishment of the Dispute Board in accordance with the General Conditions of Contract for the civil works.
8. To ensure adequate project management and QA/QC procedures, the Consultant must include in the technical proposal a suitable Construction Supervision Management Program (CSMP) emphasizing project organization to meet its budget and schedule objectives. The CSMP will address at a minimum the following issues: resource management; plans, construction, and laboratory equipment management; traffic management (during the construction), traffic and construction safety administration; engineering value analysis; environmental conservation and remediation; performance and critical path planning and monitoring and project reporting systems. The CSMP must also demonstrate compliance with the ESMP and SEP in this TOR.

# **SCOPE OF SERVICES**

The Consultant shall be solely responsible for the timely completion of reports and the effectiveness of Contractor supervision.

The scope of services generally comprises but is not limited to:

* Review of the design and oversee the civil works to ensure that the quality and the completed works meet all the standards and specifications, including the environmental protection measures, set out in the works contract document;
* Ensure that all works comply with the agreed schedule and budget, terms and conditions of the Contracts, standard engineering practice, and GoGY policies;
* Monitor, evaluate and report on progress and quality of works throughout the duration of the project;
* Provide general guidance and issue instructions to the Contractor;
* Make engineering decisions and issuing subsequent sign offs in consultation with the MoPW, and
* Advise the MoPW on progress, quality control and implementation issues, if any.

The specific tasks of the Consultant will include, but not be limited to:

## **Design Review**

Immediately upon receipt of design documents and specifications, the Consultant will review the design for omissions, coordination and systems, and materials that may not be wholly appropriate for its intended use. Following receipt of design documentation for the subsequent structures the Consultant will conduct design reviews in conjunction with the Client. The reviews shall involve a Constructability Review and Value Engineering effort. The Consultant shall provide a written report of such reviews, and the proposed solutions for resolving issues.

The Consultant shall perform the following tasks, as a minimum:

1. Verify that all applicable mitigation measures, QC/QA procedures and specifications, and all environmental aspects of management of the sources of construction materials are properly incorporated into the bidding documents.
2. Contact Utility Companies including but not limited to: Guyana Water Incorporation (GWI), Guyana Power and Light (GPL) Company, Guyana Telephone and Telegraph (GTT) Company, and find out about location of any water supply pipelines, electricity supply, telephone cables and like, which will be in the way of construction and update drawings as to the location, number size and type of utility that passes through or is in the vicinity of the construction sites.
3. Review alternative construction schemes or techniques that warrant consideration because of possible lower cost, short construction time or better product, or enhanced safety precautions.
4. Prepare such additional designs and drawings that are considered necessary for the information of the Contractor to enable him to execute the works in an efficient manner.
5. Prepare and issue to the Contractor, Construction Drawings with the necessary amendments arising from the Constructability Review. These drawings are intended to supplement the design drawings and must include setting out information as well as include the identification of all interdependent elements associated with the design e.g utilities, fences, existing drains, etc.
6. Review and revise contract documents to; a) cater for phased implementation of the project if necessary due to budgetary/ other limitations. Works are inclusive of, but not limited to, the production of a revised Bills of Quantities, Drawings and Technical Specifications b) ensure that contract documents conform to the requirements of the MoPW.
7. In general, the Working Construction Drawings shall include the following and all other details necessary to supplement the design drawings:
8. Longitudinal sections of drains showing inverts and grade
9. Details of connection points with project drains and all intersecting channels e.g. outfall channels, alley-ways, etc.
10. Geometric layout of intersections
11. Geometric layout of traffic lights and appurtenances
12. Geometric layout of traffic sign
13. Geometric layout of road markings eg. edge lines, center lines, pedestrian crossings.
14. Geometric layout of bus stops and lay-bys
15. Geometric layout of structures and bridges
16. During the project constructability review, the Consultant will establish and erect monuments or refence marks of the original horizontal and vertical control points used for the project design and present them on a separate plan named "Project Control Points".
17. The Consultant will set stakes on construction centreline or an offset line every 300m on tangent and at points of curvature, tangent deflections, and spiral control. The Consultant will loop and set benchmarks shown on the Project Control Plans and temporary benchmarks as necessary to establish points every 300m along the project.
18. The Consultant will provide a staked layout or a base line so that structures can be staked radially. Before staking the layout, the Consultant will discuss the staking method used with the Contractor. The staked layout will include witnesses (reference marks) and two benchmarks. The Consultant will provide a staked layout diagram showing witnesses, angles, and coordinates.

## **Construction Supervision**

1. Assign an experienced and suitably qualified Resident Engineer (RE), acceptable to the MoPW and IsDB together with the necessary site staff as shall be approved in writing by the Coordinator, WSG. The RE must have extensive experience in construction supervision and contract administration, quality control of roads, highways and bridges projects in developed and developing countries funded by international donor agencies. Well versed with the conditions and provisions for international financial institutions in roads and bridges projects (based upon FIDIC conditions). Successfully completed several projects both design and construction in the developed and developing countries in utilizing modern design and construction technologies and practices.
2. Assign qualified Engineers and field staff to determine compliance with the requirements of the contract drawings and specifications. Assume full responsibility for the supervision in the field of all construction and quality control of the Contractor’s work, in accordance with the relevant specifications and the Contractor’s obligations under the Conditions of Contract.
3. The RE will report directly to the Coordinator, WSG or such personnel as may be appointed by the Coordinator, on all work activities related to, QA/QC procedures and the project information and reporting systems. The RE will also investigate, report and advise on any unusual circumstances, which may arise during construction. In addition, the RE shall prepare guidelines for his staff to use in supervising construction. The Consultant will be responsible for the implementation of all required QA procedures and to enforce all QC programmes.
4. The Consultant shall maintain a qualified and experienced representative, approved by the Coordinator, WSG and other required personnel at the site during all times the Contractor is working, to supervise the work, ensure conformance with the specifications and to issue instructions as required.

**SURVEYS**

1. Provide all relevant survey information and data to enable the Contractor to set out the works properly in accordance with the drawings. Verify survey base lines and benchmarks as set out in the field by the Contractor. Check construction locations and elevations established by the Contractor to ensure they confirm to the drawings.
2. Conduct field surveys necessary for checking the detailed staking out of construction as carried out by the Contractor. This would include among others checking of grade stakes offset from the survey base line and clear of construction, checking of grade sheets furnished by the Contractor, checking location and grade stakes for all drainage, utility and building construction; furnishing location and elevation of the construction works covered by the construction contract; vis-a-vis the verified and updated construction drawings. All the foregoing checks are required to assure Contractor conformance with the Contract Documents.
3. The Consultant shall Maintain contact Utility Companies including but not limited to: Guyana Water Incorporation (GWI), Guyana Power and Light (GPL) Company, Guyana Telephone and Telegraph (GTT)Company as it relates to the utilities that passes through or is in the vicinity of the construction sites.
4. Assist the Contractor in identifying locations for erecting boundary monuments, and perform frequent checks, as necessary, of these monuments after they are erected by the Contractor
5. Furnish for the use of the Contractor all necessary ground and topographic information and controls for the project works establishment including work area limits for quarry stockpile, approved waste disposal locations, haul roads, etc.

**WORK SCHEDULE**

1. Review and recommend for approval (using the CSMP) the Contractor’s work schedule or revisions thereto including a critical path diagram for the Project and any plans or programmes that the Contractor is obliged to furnish for the Engineer’s (Employer’s Representative’s) approval. Verify or resolve all technical and environmental issues to ensure proper project schedule implementation, thereby averting work delays and related contractor’s claim. Prepare an initial and updated disbursement schedule based on the approved work schedule.
2. Assess the adequacy of all inputs such as materials and labour provided by the Contractor and his methods of work in relation to the required quality, EMP specifications and management plan, rate of progress and, when required, take appropriate action to expedite progress. Maintain a site diary, daily log sheets and other records in accordance with generally accepted practices. Keep and regularly update a list of the Contractor’s equipment (and their condition) to ensure compliance with the list of equipment and operation procedures to meet environmental specifications (protecting vegetation and natural fauna, controlling erosion, drainage blockage, noise, air quality, soil and water contamination, disposal of toxic and non-toxic materials, highway safety of motorised and non-motorised traffic, etc.) The environmental inspectors will also evaluate the success of re-vegetation and soil stabilization measures taken along the road reserve. This shall include the results of visual inspection and documentation of the vegetation used, and the systems applied to stabilize slopes, as well as the natural recovery of native flora in areas disturbed by the works.
3. Inspect and evaluate all Contractor installations and operations of offices, housing camps, quarries, shops, warehouses, production and storage yards for precast elements and other accommodations to ensure compliance with the terms and conditions of the Contract Documents. Monitor permanently the conduct of workers towards neighboring communities and the quality of the environmental work carried out by the Contractor. Also investigate and solve issues raised by communities related to abuses, violations and conflicts caused by the behavior of workers and other construction activities (e.g. traffic, accidents with victims, hunting, dust, property damage, conflicts with communities, etc.). The environmental inspectors will inform the communities impacted where and how they may be contacted.
4. The Consultant shall carry out night audits to evaluate environmental condition within the construction zone on every fortnight or as requested by the Client/ Engineer.
5. Resolve all issues, which the Contractor may present within the project budget and schedule and devise technical solutions to avert cost overruns and construction delays.
6. The Consultant shall review claims, which the Contractor may present, for additional compensation and /or extension of time within the limitations of the construction contract as necessary during the progress of work to cover possible changes within the general scope of the contract.
7. The Consultant shall determine the amount to be added to, or deducted from payments to the Contractor for any additional work added or omitted. Should the rates set out in the contract not be applicable, the Consultant shall negotiate new rates with the Contractor for additional work and make recommendations for approval.
8. Measure and compute quantities of approved and accepted work and materials and check and certify the Contractor’s interim and final payment certificates. Using the CSMP, maintain up-to-date records of remaining quantities to be incorporated in the work and cost estimates.
9. Report monthly on the progress of the works, Contractor’s performance, quality of works and the project’s financial status and forecasts. Using the CSMP, prepare and transmit these to the Coordinator, WSG showing quantities incorporated in the work at the end of each pay period, and also showing monies earned by and due to the Contractor. The report on the environmental works shall describe the activities of the inspectors during the preceding month and include recommended measures and sanctions on the Contractor in case of violations.
10. Prepare monthly Quality Assurance and Environmental Monitoring Reports.
11. Using value-engineering procedures, prepare all necessary variation orders including altering or preparing new detailed drawings, plans and specifications and other details. Inform the Client of problems or potential problems which might arise in connection with the construction contract and make recommendations for possible solutions within the contract cost and schedule.
12. The Consultant shall review alternative designs for bridges or other structures submitted by the Contractor in lieu of original designs, and check all relevant calculations and details submitted, advising the Client as to their acceptability. Inform the Contractor as to the acceptability of the alternative design.
13. Review and approve the safety plan as proposed and submitted by the Contractor and inform the Client and the Contractor as to its acceptability. The safety plan shall include, inter alia, all temporary staging and formwork, and all relevant calculations/details submitted by the Contractor, and the sequence of erection of all staging, lifts of formwork, cofferdam details, items of temporary works in connection with retaining walls, piers and abutments, steel composite construction or concrete framed structures within the contract.
14. The Consultant shall check and modify or prepare bar bending schedules as may be necessary to enable the Contractor to carry the works.
15. Furnish timely assistance and direction to the Contractor in all matters related to interpretation of the contract documents, ground survey controls, quality control testing, environmental mitigation measures, and other matters related to the contract and the progress of the Project.
16. Organize the supervision of the works (using the CSMP) with proper allocation of responsibilities to the individual inspectors, and supervise their work in order to ensure that it is effectively executed.
17. Compile systematic records of the Environmental Inspector's findings and what actions have been implemented as a result thereof.
18. Prepare and maintain inspection and engineering reports and records to document adequately the progress and performance of the works.
19. Review all Contractor's working drawings, shop drawings, erection drawings, and drawings for temporary works, and react as appropriate thereto.
20. Perform verification surveys of all Contractor's stake-out surveys for roadway centerline alignment, structure location survey and vertical control benchmarks; perform initial cross-section and periodic and final survey measurements of completed and accepted works or partial works to determine quantities. The Contractor is required to perform all physical surveys needed for construction purposes and for his use.
21. Ensure the receipt of, and maintain as permanent records, all warranties required under terms of the contract documents for materials and equipment accepted and incorporated in file Project. Approve all local materials incorporated in the Project and their sources.
22. Prepare As-Built Drawings for all works as the work progresses using computerized methods, in coordination with the CSMP. These As-Built Drawings should be produced premised on the Contractors “As-Built” plan submissions.

**LABORATORY AND TESTING**

1. Specify in the proposal the list of laboratory equipment planned for use on the project.
2. Perform all laboratory and field testing of materials and products needed to assure that the quality as required by the plans and specifications are obtained making use of the Contractor’s laboratory facilities or the MoPW’s laboratory in Georgetown or such laboratory or testing facilities approved by the Client.
3. Maintain adequate records of all tests performed.
4. Also notify the Contractor of any defects in his work and stop operations connected with the defective works until the defects are rectified.

**SAFETY ENVIRONMENTAL MONITORING**

1. Review measures taken to ensure the safety of road users and construction workers. Also review environmental protection measures to ensure that every reasonable action has been taken to protect life, environment and property, and monitor that traffic circulation is maintained properly by the Contractor, according to the approved traffic management plan, at all times. Report problems encountered or anticipated relating to unforeseen direct environmental impact of construction activities at borrow sites, concrete or asphalt plants, highway sections and construction camps and immediately advise the Contractor on measures that should be taken to mitigate impacts.
2. Perform value analyses on elements of the construction project for the Project Manager where the Contractor is given incentives to reduce construction costs, and make presentations to the Project Manager for the value analyses submitted and redesign the elements for implementation.
3. Upon ninety-seven percent (97%) completion of the works the Contractor shall request for an inspection in order to obtain a Substantial Completion Certificate. Following this written request by the Contractor, an Inspection Team will be formed from representatives of the Consultant, the Client, other Government Agencies, and the Contractor, to inspect the works. Should the works prove to be substantially complete, the Consultant will prepare the Certificate of Substantial Completion to be signed by the Project Manager and issued to the Contractor. Should any work, which is deemed substantially complete, be found unacceptable, the Contractor shall be informed in writing of the items that need to be rectified. This Certificate of Substantial Completion will include a detailed plan that ensures compliance with the Bidding Documents in terms of quality of the road surface, Right of Way and compliance with all the Technical and Environmental Specifications and Highway Safety Guidelines.
4. When in the opinion of the Inspection Team, works are considered substantially complete but there remains outstanding works to be completed by the Contractor, the Consultant will ensure that the Contractor signs a Certificate of Outstanding Works, before the Recommendation of Substantial Completion becomes effective.
5. Conduct final inspection of each completed structure and if found to be acceptable, issue a partial completion certificate to the Contractor. This shall be accompanied by the Environmental Management Report, Final Measurement, Final Bill of Quantities, and As-Built Drawings.
6. Perform any and all other items of works not specifically mentioned above, but which are essential to successfully supervise and control the construction activities in accordance with the plans, specifications and terms of contract. The Consultant's responsibility for the site supervision of the works shall continue until the Contractor has completed all outstanding works to the satisfaction of the Client.
7. The Consultant shall advise and assist the Employer in any dispute that may arise with the Contractor, and give firm opinions on any claims that the Contractors may put forward. The Consultant must support his opinion by written reports describing all elements upon which his opinions are based. Any advice in arbitration or litigation matters arising out of the Project shall constitute additional services.
8. The Consultant shall decide on all claims, payments, questions, disputes and differences which are left to their discretion under the Terms of the Contract or Contract and shall assist the Employer in dealing with all other claims, payments, disputes and differences relating to the Employer with regard to any matter which may be the subject of arbitration or at any inquiry dealing with any matter arising from or in connection with the execution of the works.
9. The Consultant, shall notify the Employer, within five (5) days of the occurrence of: (i) circumstances that have resulted or are likely to result in any non-compliance with the Environmental and Social Requirements, or in any Project-related adverse impact relating to any environmental or social matters, including any deaths or significant injuries or accidents, release of hazardous or contaminating substances, explosions or fires; (ii) any material/ written communication with any authority relating to any environmental or social matter; or (iii) any claim or material complaints relating to environmental or social matters.

**STAKEHOLDER CONSULTATION MEETINGS**

1. The Consultant shall conduct quarterly public consultation meeting to discuss all the social and environmental issues on the project.
2. The consultant shall coordinate activities along with the Utility companies (Guyana Water Inc., Guyana Power and Light Inc. and Guyana Telephone and Telegraph Company Limited) to ensure that all utilities are relocated in a timely manner as to not cause delays in project execution.
3. The consultant shall coordinate all activities relating to ensuring that the physical infrastructure for the provision of potable water and electricity are in place at the contractor’s campsite within one month from identification of campsite.

**POST CONSTRUCTION**

1. A Post Construction/ Final Report summarizing all the construction activities and/or contract changes, claims or disputes or any other substantive matters having an effect on the amount, cost and progress of the works. The number of hard copies of this report will be three (3) and in electronic form (editable and non-editable formats). The copies of the Final Report shall be submitted to the Coordinator, WSG.
2. Provide the Coordinator, WSG with one full size set 'as-built' and one set of record reproducible drawings on stable base material and one 'as-built' in electronic format showing all construction details including among others, final plans, road structure; and foundation drawings, cross-sections, profiles, pavement systems, drainage layouts, sluices and utility lines within the road reserve, and all construction data, records, geotechnical information, field books; lighting; safety elements, etc., properly indexed and catalogued in the form of a road maintenance management data base. The as-built drawings will be completed not later than two months after acceptance of the completed works. These As-built Drawings should be produced based on the Contractors “As-Built” plan submissions. The electronic submission should be in digital format (‘.dwg’ extension).
3. A detailed maintenance plan that ensures compliance with the Bidding Documents in terms of quality of the road surface, right of way and compliance with all the Technical and Environmental specifications and highway safety guidelines.
4. The Consultant shall decide on all issues, payments, questions, disputes and differences and shall assist file Project Manager (Employer’s Representative) in dealing with all other issues, payments, disputes and differences relating to the Client with regard to any matter which may be the subject of arbitration, inquiry or litigation and, if necessary, assist the Client before any court or in any arbitration or at any inquiry dealing with any matter arising from or in connection with the execution of the works.

# **REPORTING REQUIREMENTS & DELIVERABLES**

The Consultant shall submit the following reports and documents, all in English, to the Ministry of Public Works.

1. **Indexed Report**: consisting of photographs showing the general condition of the roadway, structures to be demolished/ reconstructed/ rehabilitated or in some way will be affected by the Contractor and their immediate surroundings. This report shall be submitted at least a month before the Contractor commences construction in three (3) hard copies and one (1) soft copy.
2. **Inception Report**: At a minimum shall include:
3. Initial findings
4. The Consultant’s detailed work schedule and methodology including the schedule and scope of all surveys, investigations and tests, etc. that are to be conducted
5. A program for the use of resources inclusive of personnel, equipment and materials, and
6. Proposed outline for the reports that are to be submitted.

This report shall be submitted within twenty-one (21) days after Commencement Order in three (3) hard copies and one (1) soft copy.

1. **Project Constructability Report**: will present the results of the constructability review including any proposed revision to the designs, project implementation programme and cost estimates. This report shall be submitted within two (2) months of the Commencement Order being issued in three (3) hard copies and one (1) soft copy.
2. **Monthly Progress Reports**: briefly and concisely describing all construction activities and progress for the previous month, and report on environmental monitoring during construction. Problems encountered, or problems anticipated, shall be clearly stated, together with steps taken or recommendations for their correction. These reports shall also list the Contractor’s equipment and work force disaggregated by sex and age. It will also indicate the work to be performed during the coming month, expenditure record, provide reasonable cost projections to the end of the Project and current estimates of final cost and completion date. The use of bar charts, percentage progress or slippage shown graphically, and photos to illustrate points will be expected. This report is to be submitted by the tenth (10th) day of each month in three (3) hard copies and one (1) soft copy in the approved form.
3. **Environmental and Social Compliance Report**: will be required on a monthly basis from the Supervisory Engineering Firm. This report is to be submitted by the tenth (10th) day of each month in three (3) hard copies and one (1) soft copy in the approved form.
4. **Post Construction/ Final Report**: will include a summary of construction activities, total effect or contract changes, claims or disputes or any other substantive matters having an effect on the amount or progress of the work. A financial analysis of the project and a critical study of any major problems which may have arisen during the performance of the project shall also be included along with an Environmental Management Report, Final Measurement, Final Bill of Quantities and As-Built Drawings. This report is to be submitted within two (2) months of the issue of the certificate of practical completion.
5. **Maintenance Plan**: A detailed Maintenance Plan that ensures compliance with the Bidding Documents in terms of quality of the road surface, right of way and compliance with all the technical and Environmental specifications and highway safety guidelines. Guidance should be given on how to conduct activities regarding maintenance of the corridor. Its focus, among others, shall address the types of equipment, materials, techniques, and other information needed to properly carry out basic maintenance activities such as patching a pothole or bridge inspections.
6. Any other reports mentioned in the Contract Document.
7. **Training**: The Consultant shall conduct lectures and laboratory exercises in the area of recycling of pavement materials including asphaltic concrete with regards to cold-in-place recycling, Hot-in-place recycling, Recycled Hot Mix Asphaltic Concrete and Full-Depth Recycling. In addition, the consultant shall facilitate lectures in the design of bridges and culvert in particular pre-stressing technology.

The Consultant shall provide at least 5 copies of the Software, Civil 3D and conduct training in this programme.

Further, the Consultant shall facilitate no more than five (5) persons from WSG a site visit to an international recycled asphaltic concrete plant and a concrete pre-stressing plant. In addition, to the recycling and pre-stressing plant inspections, the consultant shall conduct site visits to international projects in which recycling of Asphaltic Concrete and pre-stressing technology are being utilised.

*Cost for these items must be clearly listed under reimbursable items as “Training”. Payment will be facilitated under reimbursable expenses and costs will constitute part of the tendered price. Failure to adequately price for these items does not preclude the Consultant from delivering these items during the project.*

# **QUALIFICATIONS AND EXPERIENCE OF KEY SPECIALISTS**

1. The Consultant must ensure that the required, professional, technical and administrative inputs, required to deliver on the project are considered, costed and made available to the project as necessary. These must be translated into the Technical and Financial submissions made by the Consultant.
2. The Consultant shall determine and specify (considering the nature and scope of the project) which professionals will be required, their corresponding experience and their input time to the project, however, at a minimum, the Key Personnel listed below shall be considered.
3. The cost of the consultancy will include the Consultant’s remuneration as well as the costs of all incidentals associated with the conduct of the consultancy. The incidentals include, but are not limited to the costs for; surveys, field and laboratory testing, trips, travel allowances, communication, support staff services, local transportation, living and office accommodation, report and contract documentation and office supplies.
4. The Consultant shall provide sufficient evidence and detail of qualifications, certification, experience and availability for and of personnel which must be available for the required time to allow the Consultant to deliver on the requirements of the Formulation and Supervision aspects of the contract(s).
5. At the start of the assignment(s) i.e. Formulation and Supervision, the Consultant must provide confirmation of availability of the personnel proposed at the time of Bid. Where personnel are no longer available the Consultant must provide similar evidence to assure that replacement personnel are of similar or exceed the qualifications and experience of the previously submitted. The MoPW reserves the right to accept or reject based on changes to the Consultant personnel.
6. The site is required by the MoPW to be under the Supervision of a competent Engineer, Clerks of Works or Foreman at all times.
7. Key personnel must sign their own submitted declarations.
8. It is envisaged that part-time inputs may be required from non-key experts including a Senior Materials Inspector, an Environmental Inspector, an Office Engineer, two (2) Survey Assistants, an AutoCAD Technician and a Secretary.
9. Key Personnel:
10. **Key Expert No. 1: Resident Engineer**
11. Education: A Master’s Degree in Civil Engineering, Highway Engineering or equivalent from a recognized university.
12. Experience: At least fifteen (15) years of experience in road design and construction. The candidate must have been a registered professional engineer for a minimum of ten (10) years and be a corporate/chartered member of international civil engineering professional organizations The candidate must also have at least five (5) years of experience as a Team Leader working on projects in developing countries and must have performed this role on at least two (2) projects of this size and complexity within the past five (5) years.. The Team Leader will reside in Guyana full time throughout the period of the services. The candidate must have excellent technical, management and communication skills, and must be fluent in spoken and written English.
13. **Key Expert No. 2: Structural/ Bridge Engineer**
14. Education: A Master’s Degree in Structural Engineering or equivalent from a recognized university.
15. Experience: At least 10 years’ experience in designing, constructing and/ or supervising the construction of major structural works. The candidate must have been a registered professional engineer for a minimum of six (6) years and be a corporate/ chartered member of an international civil engineering body. The candidate must have performed this role on at least two projects of this size and complexity within the past five (5) years. The candidate should possess knowledge and skills in bridge load tests, investigations of bridge failures, bridge design reviews and bridge assessments and maintenance. This person is required to be full time during construction supervision.
16. **Key Expert No. 3: Site Engineers**

Two (2) Site Engineers are required to be full time during construction supervision.

1. Education: A Bachelor’s Degree in Civil Engineering from a recognized university.
2. Experience: At least ten (10) years of experience in construction and/or construction-supervision of Civil Engineering projects. Additionally, he/she must have successfully completed at least one (1) project of a similar nature as a Site Engineer supervising roads construction within the last five (5) years. This professional must be fluent in English language.
3. **Key Expert No. 4: Quality Assurance – Quality Control/ Materials Engineer**
4. Education: A Master’s Degree in Civil Engineering from a recognized university.
5. Experience: At least ten (10) years of experience in establishing quality assurance programs in highway construction projects and supervising the testing and evaluation of highway construction materials used in modern highway construction techniques including at least four (4) years on projects of a comparable nature in developed countries or on projects in developing countries with international financing. The candidate must be thoroughly familiar with all the standard laboratory testing procedures specified in the Contract Documents and must have had past experience in pavement design and bituminous mix design works as well as earthworks. The candidate must have been a registered professional engineer for a minimum of six (6) years; be a corporate/chartered member of international civil engineering professional organizations; and must have performed this function on at least two similar projects within the past five (5) years. The candidate must have excellent technical, organizational and communication skills, and must be fluent in spoken and written English.
6. **Key Expert No. 5: Environmental Specialist**
7. Education: A Master’s Degree in Environmental Science or equivalent from a recognized university.
8. Experience: At least seven (7) years’ work experience and familiarity with all aspects of environmental management and with significant experience in environmental management and monitoring of projects, environmental assessment, and/or implementation of environmental mitigation measures on construction projects. The candidate must have performed this role on at least two (2) projects of this size and complexity. The candidate shall also have experience in working in teams of multi-discipline experts.

# **DURATION**

Consultancy services shall commence work on the day the Consultant receives a Commencement Order from the MoPW.

**Design Review**

The provision of design review and tender support services. The anticipated component of the consultancy will be for a period of four (4) months.

**Construction Supervision**

The provision of construction supervision and general project management services. The anticipated component of the consultancy will be for a period of thirty-six (36) months. Twenty-four (24) during the construction period and twelve (12) months during the defects liability period.

# **MANPOWER, SCHEDULING AND COST**

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

(a) Consultant(s) remuneration;

(b) Consultant(s) out-of-pocket expenses;

(c) Support staff services;

(d) Equipment hire;

(e) Communication costs;

(f) Report production costs;

(g) Contract documentation production costs;

(h) Supervision costs; and

(i) Survey costs

# **COMMENTS BY THE CONSULTANT**

The Consultant may make comments on, and make suggestions for, improvements to these Terms of Reference (TOR). The financial implications, if any, of these recommendations should be indicated separately in the Financial Proposal.