Terms of Reference
Consultancy Services for Monitoring/Supervision for Cote D'Ivoire Border to Toe Town to Zwedru (85km) of the South Eastern Road Corridor

1. BACKGROUND

The Government of Liberia (GOL) acting by and through the Ministry of Public Works has envisaged developing a section of the South-Eastern Corridor. For development of this corridor, the Government of Liberia has received funding from the World Bank towards the cost of the Rural Economic Transformation Project (RETRAP). However, the Cote D'Ivoire Border to Tow Town to Zwedru section of the corridor (85 km) is being developed in Design Build and Transfer model with financing from the World Bank through Rural Economic Transformation Project (RETRAP).

The project extends the recently constructed Monrovia-Ganta Road under the Output and Performance based Road Contracting (OPRC) contracts on that route. The project is like the OPRC in that payment will be based on completed sections. The payment will not be paid just per kilometer provided, but dependent also on the quality of service provided.

The Project requires efficient collaboration between all parties involved, especially when considering that the Cote D'Ivoire Border to Toe Town to Zwedru Road section of 85km length, is an associated facility for the Ganta to Saglepie to Tappita to Toe Town. In this project, the role of the triangle, composed of the Client/IIU-MPW, the Contractor/Contracting Entity and the Monitoring/Supervision Consultant in managing the road is particularly important. Each of them has specific and general responsibilities listed below but not limited to:

The Contractor / Contracting Entity is responsible, inter alia, for:

- Managing the entire project Right of Way (RoW) during the rehabilitation
- Managing bridges during Rehabilitation
- Quality control of the roads and bridges during Rehabilitation, p
- Data collection (quarterly) to evaluate the condition of the road and fulfillment of service levels required.
- Detailed design of the project.
- Preparation and substantiation of periodic payments certificates
- Creation and updating of the asset data base required, using processes and technology acceptable to the Client/IIU-MPW
- Preparation of updated schedule of activities to be carried out.
- During the first month after the date to commence, the Contractor Contracting Entity will carry the following activities:
    - Mobilize majority of the required equipment, specifically required for the construction works.
    - Complete the detailed designs with all field investigations for at least the first 5 -10 km of the road, and

The Monitoring/Supervision Consultant is responsible, inter alia, for:

- Act independently on behalf of both the Client/IIU-MPW and the Contracting Entity Contractor to review and monitor all activities associated with Rehabilitation Works and Services of the Project Road to ensure compliance with provisions of the Contract Agreement.
- Visit, inspect and report on Client/IIU-MPW/Contracting Entity various aspects of the Project, *including monitoring of the Contractor's / Contracting Entity's environmental and social obligations*, and carryout all such activities as are provided in the Contract.
- Provide qualified and experienced personnel to monitor the works carried out by the Contracting Entity
- Monitoring the fulfillment of the Contract requirements based on the schedules programmed and presented by the Contractor/Contracting Entity which have been approved by the Client/IIU-MPW.
- Overall monitoring of road rehabilitation by the Contractor/Contracting Entity, based on achieving and maintaining the required and designed levels of service.
- Overall monitoring of fulfillment of all levels of service for bridges during rehabilitation
  - Evaluation of the quality and residual life of road pavement, designed, constructed and maintained by the Contractor/Contracting Entity.
  - Evaluation and recommendation for approval of all designs proposed by the Contracting Entity Contractor
  - Evaluation and monitoring of the fulfillment of Environmental Impact Assessment and Social Impact Assessment by the Contractor/Contracting Entity.
  - Managing the Quality Assurance of the roads and bridges and monitoring the quality control of the Contractor/Contracting Entity.
  - Monitoring, overall supervision and recommendation for approval of Data Collection Reports submitted by the Contractor/Contracting Entity.
  - Review of all technical documentation required for payment and recommendations for approvals of the Periodic Payment billing presented by the Contracting Entity
  - Review and monitor the process leading to the creation and updating of the asset database using technology acceptable to the Client/IIU-MPW.

The Client/IIU-MPW is responsible, inter alia, for:

- Management and Administration of the Road construction contracts, especially with all the new parameters included in DBT Projects.
- Financial Management of the project, including timely payments to the Contracting Entity Contractor after the recommendation of approval by the Monitoring/Supervision Consultant.
- Management of the Database prepared and updated by the Contracting Entity Contractor.
- Enforcement of the law, especially on resettlement, right of way and axle load issues.

2. OBJECTIVES OF THE ASSIGNMENT

The Client wishes to employ the Consultant to represent her as the Project Manager, in accordance with these TOR.

The objective of the Consultant's role as the Project Manager is to provide timely and orderly required advice to minimise any potential risk to the Employer by verifying the achievement of all contractual requirements under the civil works contract within the stipulated time and budget.

Within that role, the Consultant will be responsible for assisting the Client to establish and implement an appropriate regime for managing the civil works contract and for identifying future developments based on lessons learnt.

The Consultant's Services as Project Manager are defined and described as follows:

1. Development of a quality assurance strategy for approval by the Employer.
2. Within fourteen days after receipt, to review all designs and drawings submitted by the Contractor. He will also approve them including the detailed working drawings and specifications.
3. Verify that all work and materials conform to the contract and that the specified engineering/service levels are achieved before recommending the contractor's payment for certification and payment by the Employer-as defined under the General Conditions of the civil works contract, Clause 50.1.
4. Provide the inspection services during the defect liability period, after the taking-over certificate has been issued.

The rehabilitation/construction works will be carried out under the construction contract, namely, "Rehabilitation of Cote D'Ivoire Border to Toe Town to Zwedru (85km) of Southeastern Corridor of Liberia under Design Build and Transfer (DBT) Contract. The Cote D'Ivoire Border to Toe Town to Zwedru section of the corridor is in a total length of 85 km (from10.6+000 to km 225+000) is being developed in Design Build and Transfer model with financing assistance from the World Bank.

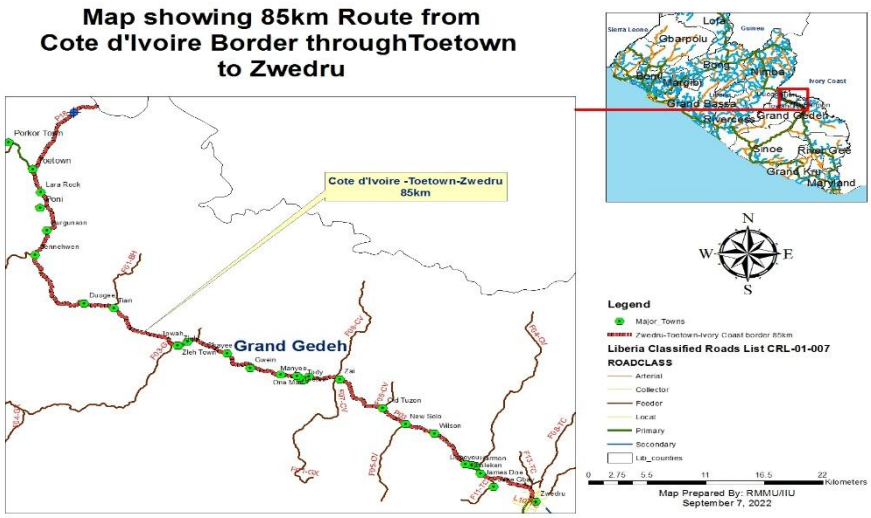
For the Monitoring Consultant to fully understand the requirements of the present TOR, it is essential that the consultant has a detailed understanding of both, the concepts and operational implementation of Design Build and Transfer (DBT) under Output and Performance Based Road Contract methodology.

3. GENERAL DESCRIPTION OF THE PROJECT

The Monitoring/Supervision Consultant will oversee the design, construction, and handing over to the Client/IIU-MPW, under a DBT Contract for the Rehabilitation/Construction of the Tappita to Toe Town Road Section (40km) from the Contracting Entity.

The Project location map is shown below.

Figure 1: Map of Project Location



Tappita to Toe Town Road has the following sections:

Table 1: Road Section Details

Sl. No.	Section Name	Surface Type	Length (km)	Carriageway Width (m)	Roughness (m/km)
1	Cote D'Ivoire Border to Toe Town (0+000km-10+500km) (Part of Tappita – Zwedru stretch)	Unsealed	10.6	6.5	10.7
2	Toe Town to Zwedru (139+000-211+800)	Unsealed	72.8	6.5	10.7
3	Zwedru Bituminous Section (211+800 – 212+500	Bituminous	0.5	7.5	5.0

The Contracting Entity shall design rehabilitate and transfer the road starting from Cote D'Ivoire Border to Toe Town to Zwedru 85km..

The start and end points of the Project Road between Tappita to Toe Town are as follows:

Table 2: Start and End Point of the Project Road

Description	Location	Identification of the Point	Chainage (km)
Start Point	Cote D'ivoire Border	After Zamu Border Post	10.6+000
End Point of the minimum length of the Project Road.	Zwedru Bituminous section	Outside of Zwedru	225+000

Note: The contractor has the option of starting from two fronts.

The Project Road has several cross-drainage structures (culverts, bridges over streams and rivers). The Works involve development of a 2-lane highway with shoulders. The Contract Period is 48 months plus 12 months Defect Liability Period.

The Client/IIU-MPW's requirements, list the general specifications, the specific requirements, and Services Levels for development of the Project.

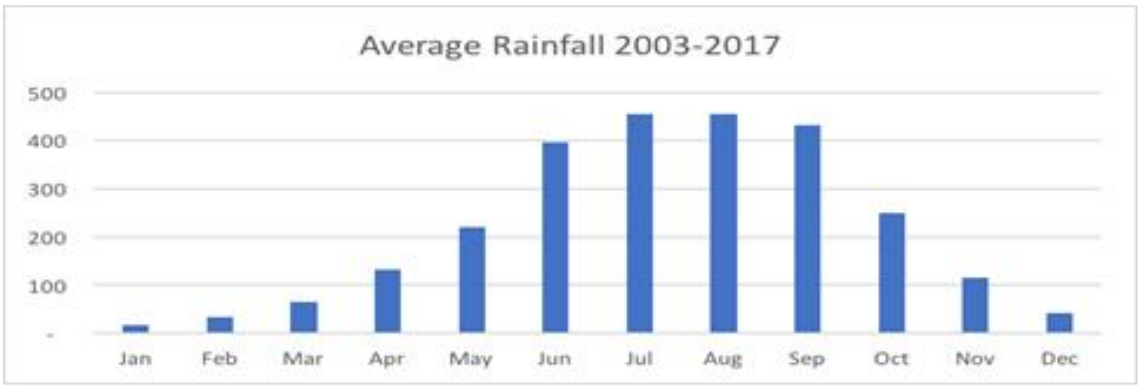
A. TOPOGRAPHY

Generally, the terrain is flat and rolling. Soil conditions of the existing unpaved road are generally good, but some bad sections result in closure of traffic in rainy season for a few days at a time.

B. CLIMATE AND HYDROLOGY

Average rainfall data from Lot 2 OPRC in Palala, an adjacent completed project not far from Ganta are shown below (average 2,612mm).

Figure 2: Rainfall at Palala



Source: OPRC Lot 2

Widespread flooding caused by high rainfall intensity is common in the corridor. The rivers and creeks have long periods of sustained high flows during the wet season, followed by a gradual decrease in flow during the dry season. The rivers are perennial.

C. VEGETATION

The carriageway corridors are within the tropical rainforest area. However, much of the forest has been replaced with secondary vegetation resulting from forest clearance for agricultural purposes and other forms of forest exploitation. The present vegetation is composed of rubber trees, open grass vegetation, farm plots, plantain, maize, cassava, pineapple, shrubby vegetation, and numerous palm trees. Very few occasional patches of high virgin forest can be seen within the road corridors.

D. GEOLOGY

Liberian Geology is mainly dominated by the presence of igneous rocks of the Leo and Man Shield of the West African Craton, metamorphic rocks, and its weathering products. Most of the road corridor develops in the Pan African Belt. The rocks of the region are of Paleoproterozoic age. Over them, some alluvial flood plains are developed, particularly in bands close to the main rivers. Sand bars are found in front of the sea, nearby the Buchanan Port, locally deposited from sea streams and winds. Also some Aeolian deposits are conspicuous, related to the Harmattan winds from the Saharan Region. Marshy lands close to the sea are rich in organic superficial deposits.

E. STAGES OF THE PROJECT

The Contractor Contracting Entity will be responsible for design, and construction works, during the life span of the project of 54 months. The stages of the project are:

- Mobilization period: Three 3) months after Start Date. During this stage, the Contracting Entity will carry out the following activities:
  a. Mobilize majority of the required equipment, specifically required for the construction works.
  b. Complete the detailed designs with all field investigations for at least first 5 -10 km of the road, and
- Construction Period: 30 months after 3 months of mobilization.
- Defects Liability Period: 24 months upon completion of construction.
- The Contracting Entity will be required to provide reasonable accessibility along the route throughout the contract. This will cover the unpaved road prior to and during construction

F. CONCEPTUAL DESIGN

The full Conceptual Design including Resettlement Action Plan and Environmental, Social Impact Action Plan and a book of drawings can be downloaded from http://www.iiu-mpw.org/. AutoCAD compatible drawings can be downloaded from https://aurecongroup-my.sharepoint.com/personal/francois_vanreenen_aurecongroup_com/Documents/Ganta%20Zwedru?csf=1&e=294e2a4e969c471b9119b2c19241fefd. Usernames and passwords will be provided upon request.

Typical cross-sections are shown below (pavement design may vary).

Figure 3: Typical Urban Cross Section

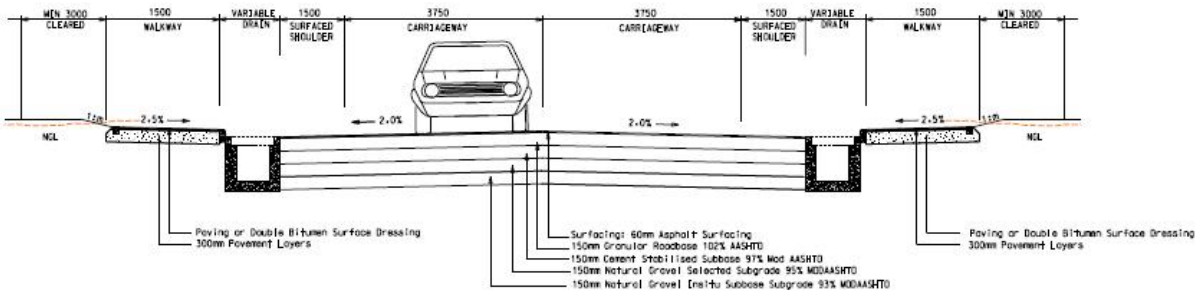
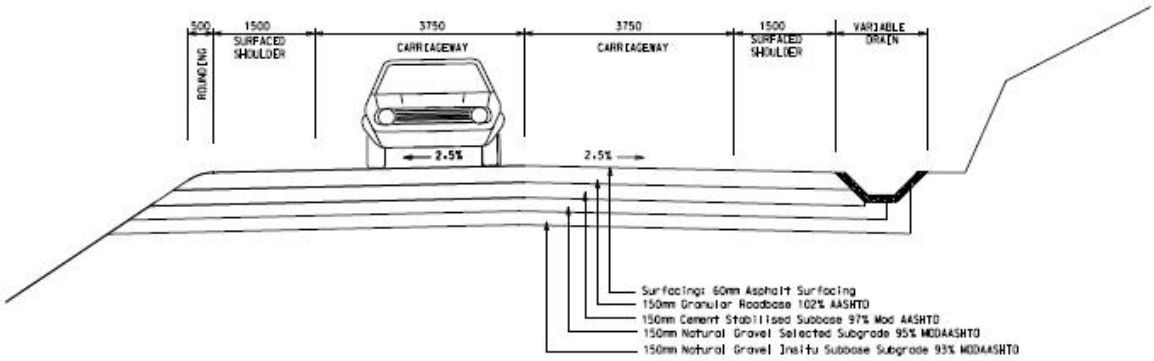


Figure 4: Typical Rural Cross Section



The recommended minimum pavement design structure is presented below, for 10% CBR and 6 million ESALS:

Table 1: Minimum Pavement Design

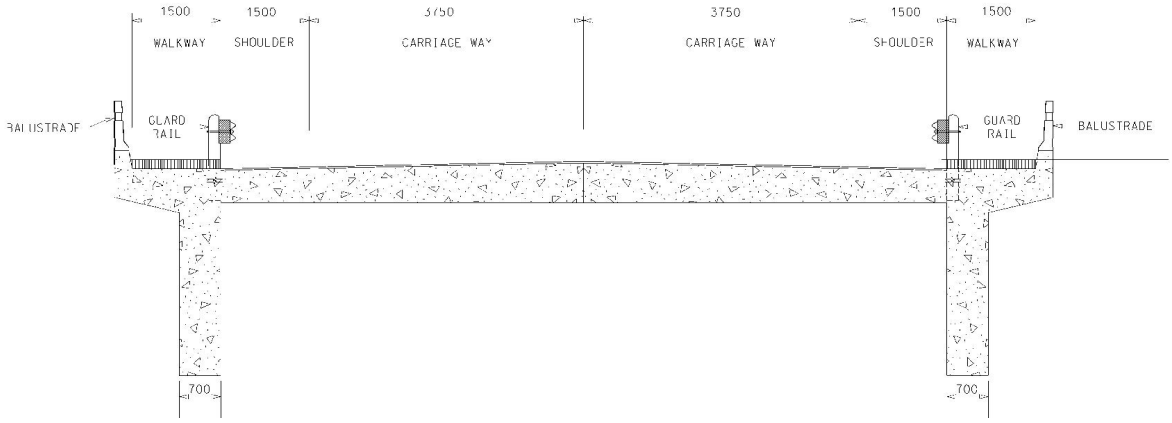
Road Section	Thicknesses (cm)			Structural Number (Layer)			SN_{Design}	Traffic	CBR	SN	SN Design
	Asphalt	GB	GSB	Asphalt	GB	GSB		$N_{8.2ton}$	(%)		
Cote D'Ivoire Borer-Toe Town – Zwedru	12.0	15.0	30.0	1.7	0.8	1.3	3.8	6 million	10	3.8	3.7

The Residual pavement life should be 3 million E80s at Transfer (year 15) and at year 14 a comprehensive pavement inspection will be carried out to identify any items that need fixing in the final year to achieve the necessary standard.

Bridges:

A list of bridges and the required intervention along the route is given in Annex C.
In the event where a new bridge is to be constructed. The minimum required width for new bridges will be 9.5m, where 3.75m is provided for each carriageway and 1m for each pedestrian side walk. The design life for any new or strengthened bridge will be 100 years. New bridges will require the following cross section or similar:However, there is not new bridge construction.

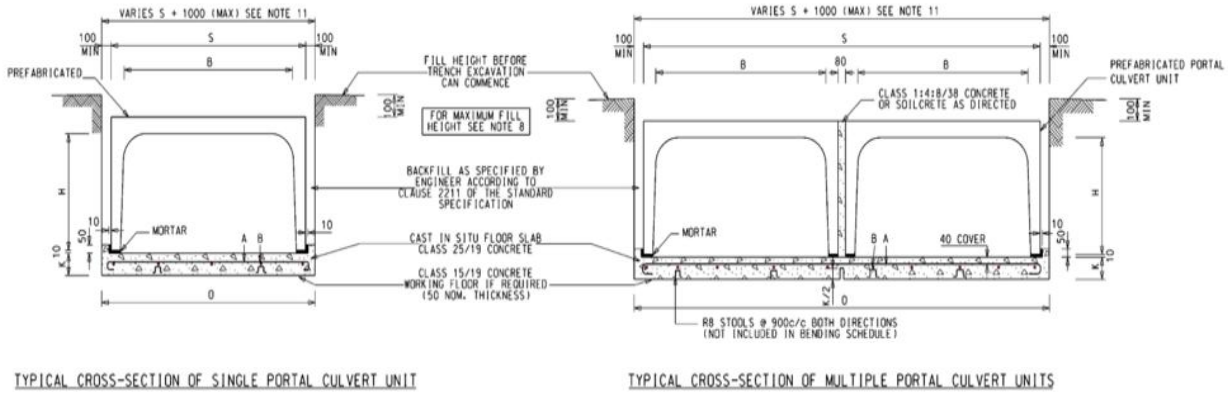
Figure 5: Typical New Bridge Cross section



Where no pedestrian walkways are present on existing structures that remain, a new walkway will be provided whilst maintaining minimum carriageway width (7.5m). This may be in the form of cantilever.

As indicated in Annex C, a number of the short span bridges will require replacing with box culverts. Typical section details for box culverts are shown below:

Figure 6: Typical Box Culvert



Generally, there are approximately one pipe culvert per kilometre (Armco or concrete) along the route and most of these are likely to require replacement. Sufficient culverts should be provided to ensure no heading up of water under design return interval rainfall events, with sufficient allowance made for the impact of climate change over their lifecycle.

All bridge structures shall be able to safely accommodate the maximum stresses of the US Highway Design Load HS 20 – 40, or US Military Standard Loading MIL.STAND.MS – 18 loadings.
Additional details are provided in the book of drawings.

4. SCOPE OF SERVICES

The Monitoring/Supervision Consultant shall provide services and assistance to the Client/IIU-MPW and Contracting Entity in monitoring of all activities under Works and Services to be carried out under the Project as envisaged in the Contract Agreement. In providing these services, the MC shall examine the detailed Work Programme for Works of the Project prepared by the Contracting Entity. Accordingly, the Monitoring/Supervision Consultant will be required to provide staffing resource of demonstrably sound and extensive expertise in the monitoring and supervision of Project involving extensive knowledge of design standards.

The Monitoring/Supervision Consultant shall provide qualified, experienced personnel to monitor the Rehabilitation/construction works as described hereinafter and ensure management, co-ordination and the efficient execution of the works. The Monitoring/Supervision Consultant shall approve the materials and the workmanship of the works. This shall be done in co-operation and consultation with the Client/IIU-MPW. The Monitoring/Supervision Consultant shall have no authority to relieve the Contracting Entity of any of its duties or obligations under the Contract. Neither time extensions nor any extra payment shall be approved by the Monitoring/Supervision Consultant without the approval of the Client/IIU-MPW

The services are divided into:

Part A: Prior to Effective Date

Part B: Rehabilitation Works

Part D: Other Requirements

Each part includes, but is not limited to the following:

4.1 Part A. Prior to Effective Date

The Monitoring/Supervision Consultant shall review the (i) detailed design, (ii)construction methodology, and (iii) quality assurance plans and (iv) the Contracting Entity's environmental and social management plans (**C-ESMP**) provided by the Contracting Entity which will contain, among others, method statement for each item of work, flow diagram depicting its internal quality control mechanisms to deliver the work in compliance with the specifications, procedure for rectifying defective works, forms for laboratory and field tests, request for inspection forms and other related forms.

- The Monitoring/Supervision Consultant shall undertake a detailed review of the pavement design, Drawings to be furnished by the Contracting Entity along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, safety requirements, topographical surveys and traffic surveys. The Monitoring/Supervision Consultant shall complete such review and send its comments/ observations to the Client/IIU-MPW and the Contracting Entity within 7 (seven) days of receipt of such Drawings. In particular, such comments shall specify the conformity with the scope of the Project, Specifications, Performance Criteria and Service Levels.

- The Monitoring/Supervision Consultant shall review any modified Drawings or supporting documents sent to it by the Contracting Entity and furnish its comments within 7 (seven) days of receiving such Drawings or support documents.

- The Monitoring/Supervision Consultant shall review the C-ESMP, emergency procedures and contingency plan provided by the Contracting Entity during the first 30 (thirty) calendar days.

- The Monitoring/Supervision Consultant shall review the Contracting Entity's Road Safety and Traffic Management Plan, method statements, Work Programme and provide its comments within 7 (seven) days of receipt thereof.

4.1.1 Part A-1. Mobilization and Design Period

The Monitoring/Supervision Consultant shall assist the Client/IIU-MPW with the review of the Contracting Entity's Quality Assurance Manual which will contain, among others, a method statement for each item of work, flow diagram depicting his internal quality control mechanisms to deliver the work in compliance with the specifications, procedure for rectifying defective works, forms for laboratory and field tests, Request for Inspection Forms and other related forms. Also, the Monitoring/Supervision Consultant shall review the Quality Assurance Plan that must clearly describe the systems, procedures and methods that will be used to deliver and monitor compliance with the Services.

- The Monitoring/Supervision Consultant will review the Environmental, Health and Safety Management Plan and Emergency Procedures and Contingency Plan presented by the Contracting Entity during the first 30 days after the Start Date.

- The Monitoring/Supervision Consultant will review the Contracting Entity's Traffic Management Plan including layout diagrams, method statements, recommended control measures, etc and recommend for client's approval.

- The Monitoring/Supervision Consultant will ensure that the Contracting Entity mobilizes majority of the required equipment specifically required for the construction works.

- The Monitoring/Supervision Consultant will review the Contracting Entity's Work Plan and ascertain that it will not exceed the months established to carry out the design and construction activities.

- The Monitoring/Supervision Consultant is required to review and recommend for the Client/IIU-MPW's approval, all designs including the pavement design, road furniture design which will be provided by the Contracting Entity. These reviews shall take into account the basis for the alternative selected, implication of the proposed design life and its impact upon the 15 years life span of the pavement and subsequent period of 10 years. The Contracting Entity must complete the detailed designs with all field investigations for at least 5-10 km of the road for each submission intended for review.

- The Monitoring/Supervision Consultant will ensure that the Contracting Entity carries out the minimum maintenance as described in the civil works contract along the road to keep the road open for the traffic.

4.2 Part B-. Rehabilitation Works Period

- The Monitoring/Supervision Consultant will evaluate the achievement of the level of performance during this stage according to the requirements in AASHTO GSH-8 Guide Specifications for Highway Construction, 8th Edition 1998" and "AASHTO LRFD Bridge Construction Specifications 2004, 2nd Edition" published by the American Association of State Highway Officials, Specifications of American Standard for Testing and Materials - ASTM 2002, the level of service presented in this document as Annex A and minimum specification of the Contracting Entity.

- In respect of the Drawings, documents and safety report received by the Monitoring/Supervision Consultant for its review and comments during the Rehabilitation Works Period, the provisions of Part A shall apply, mutatis mutandis.

- The Monitoring/Supervision Consultant shall review the monthly Construction Report furnished by the Contracting Entity and send its comments thereon to the Client/IIU-MPW and the Contracting Entity within 14 (fourteen) calendar days of receipt of such report.

- The Monitoring/Supervision Consultant shall have unhindered inspection of the Rehabilitation Works and the Project at all times in accordance with the Contract Agreement, and make out a monthly report of such inspection (the monthly **Inspection Report**) setting forth an overview of the status, progress, quality and safety of construction, including the work methodology adopted, the materials used and their sources, and conformity of Rehabilitation Works with the scope of the Project, Specifications, Performance Criteria and Service Levels. In a separate section of the Inspection Report, the Monitoring/Supervision Consultant shall describe in reasonable detail the lapses, defects or deficiencies observed by it in the Rehabilitation Works of the Project, including the Contracting Entity's environmental and social obligations. The Monthly Inspection Report shall also contain a review of the maintenance of the existing lanes in conformity with the provisions of the Contract Agreement. The Monitoring/Supervision Consultant shall send a copy of its Monthly Inspection Report to the Client/IIU-MPW and the Contracting Entity within 7 (seven) business days of the inspection.

- The Monitoring/Supervision Consultant may inspect the Project more than once in a month if any lapses, defects or deficiencies require such inspections.

- The Monitoring/Supervision Consultant shall ensure that the tests are conducted in a fair and efficient manner and shall monitor and review the results thereof. For determining that the Rehabilitation Works conform to Specifications, Performance Criteria and Service Levels, the Monitoring/Supervision Consultant shall require the Contracting Entity to carry out, or cause to be carried out, tests on a sample basis, to be specified by the Monitoring/Supervision Consultant in accordance with Good Industry Practice for quality assurance.

For verification purposes. the Monitoring/Supervision Consultant shall follow the guidelines and standards defined as under:

- *Guideline for Design of Pavement Structure – AASHTO 1993*
- *AASHTO Highway Construction 8thedition and in the American Society for Testing and Materials Standard.*
- *The Liberian Road Signs and Road Markings Standards, [June 2017]* will be used.

- In the event that the Contracting Entity carries out any remedial works for removal or rectification of any defects or deficiencies or Emergency Works, the Monitoring/Supervision Consultant shall require the Contracting Entity to carry out, or cause to be carried out, tests to determine that such remedial works have brought the Rehabilitation Works into conformity with the Specifications, Performance Criteria and Service Levels, and the provisions of Paragraph above shall apply to such tests.

- In the event that the Contracting Entity fails to achieve any of the milestones, the Monitoring/Supervision Consultant shall undertake a review of the progress of Rehabilitation Works and identify potential delays, if any. If the Monitoring/Supervision Consultant shall determine that completion of the Project is not feasible within the time specified in the Contract Agreement, it shall require the Contracting Entity to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Taking Over Certificate for Section One or Completion Certificate shall be issued. Upon receipt of a report from the Contracting Entity, the Monitoring/Supervision Consultant shall review the same and send its comments to the Client/IIU-MPW and the Contracting Entity forthwith.

- If at any time during the Rehabilitation Works Period, the Monitoring/Supervision Consultant determines that the Contracting Entity is not complying with ESHS requirements or that any work is being carried out in a manner that threatens the ESHS compliances, it shall make a recommendation to the Client/IIU-MPW for Deductions in Payments.

- If suspension of Rehabilitation Works is for reasons not attributable to the Contracting Entity, the Monitoring/Supervision Consultant shall determine the extension of dates in accordance with Contract agreement, to which the Contracting Entity is reasonably entitled, and shall notify the Client/IIU-MPW and the Contracting Entity of the same.

- The Monitoring/Supervision Consultant shall review and check the payment requests submitted by the Contracting Entity and provide its recommendations to the Client/IIU-MPW for its Payments.
- Attend and carry out Tests on Completion and issue the Taking Over Certificate for Section One and the Completion Certificate if tests are passed and Failure Notice if not.
- Identify Snagging Items, oversee carrying out and issue Defects Rectification Certificate when carried out.
- Review and comment on any Design Data or Submitted Item which is submitted under the Review Procedure.
- The Monitoring/Supervision Consultant shall inspect and review and / or measure all Service Levels achieved and recommend the application of penalties, liquidated damages guarantees for Non-Compliance with the requirements, if and when necessary.
- At all times assist the Client/IIU-MPW and Project Manager

- The Monitoring/Supervision Consultant shall verify the accuracy of the survey stations and advise the Contracting Entity to re-establish any damaged or missing stations.

- The Monitoring/Supervision Consultant shall perform all duties associated with the activities to ensure that only the best construction practice is followed, and that the final product is in all aspects equal to that specified and is executed in full compliance with the specifications.

- The Monitoring/Supervision Consultant shall advise the Client/IIU-MPW of the estimated total cost to complete the works per month and in quarterly intervals.

- The Monitoring/Supervision Consultant shall conduct all necessary inspections, review sampling, testing and analysis for all soils and materials proposed for compliance with the technical specifications at source and in the laboratory and recommend for the approval or rejection the use of soils or materials proposed by the Contracting Entity.

- The Monitoring/Supervision Consultant shall monitor the Contracting Entity's proposed work programs and work method statements, resource analysis and requirements in relation to the

required rate of progress and recommend any modification of the program determined to be necessary.

- The Monitoring/Supervision Consultant shall review and check the Payment Requests submitted by the Contracting Entity and recommend their payments

- The Monitoring/Supervision Consultant shall inspect and review and / or measure all levels of service achieved and recommend the application of penalties, liquidated damages guarantees for non-compliance with the requirements, if and when necessary

- The Monitoring/Supervision Consultant shall review the compliance with any service level criteria and ascertain that it is according to the variations and gradual compliance, during the construction stage.

- The Monitoring/Supervision Consultant shall review the claims submitted by the Contracting Entity during the construction period within 30 days of the submission of the claims and recommend settlement to the Client/IIU-MPW.

- The Monitoring/Supervision Consultant shall supervise all financial, administrative and environmental aspects as described in the civil works contract, in addition to the technical specifications.

- The Monitoring/Supervision Consultant shall confirm that access road and newly constructed paved sections are kept to contractual service levels.

4.2.1 Part B - 1 Construction Verification

The Monitoring/Supervision Consultant shall clearly understand that the Contracting Entity is responsible for its own designs, which must be reviewed, commented upon and recommended for approval by the Client/IIU-MPW. Since the liability rests fully with the Contracting Entity, the Monitoring/Supervision Consultant may only suggest necessary improvements to meet the level of engineering specifications / specified level of service conditions. The remedy for non-compliance, if the specifications / service levels are not met would result in the payment to the Contracting Entity not being made.

The following represents, but is not limited to, typical Rehabilitation/construction tasks to be undertaken by the Monitoring/Supervision Consultant:

- Check the quality of materials and Rehabilitation/construction and verify compliance with all specified requirements through intermittent random testing and inspection of the Works, as specified in the ASTM 2001.
- Verify that the laboratory equipment used by the Contracting Entity is sufficient and suitable for ASHTO 27th edition/American Society for Testing and Material Volume 4 of 2001 (ASTM) tests.
- Prepare reports as specified above.
- Check setting out of works and approve or otherwise, within 14 days, the working drawings and other documentation produced by the Contracting Entity.
- Review and recommend payments to the Contracting Entity.
- Prepare a consolidated project completion report at the completion of the contract, as follows:

one month before handing over of the Project to the Client/IIU-MPW, the Contracting Entity shall submit to the Monitoring/Supervision Consultant (Project Manager) a comprehensive report of the Project. The report shall include the complete history of the Project, including – inter alia:

- All detailed construction design (calculations, plans, etc.)

- All As-Built plans
- All quarterly Level of Service reports
- All road repair reports
- All QC reports
- The complete detailed design of the rehabilitation including the residual-life calculation
- Ensure compliance with the Environment Mitigation and Resettlement Action Plans to the extent relevant in the construction contract.
- Check the 'As Built drawings" prepared by the Contracting Entity and approve them.
- Prepare Final Completion Report Rehabilitation/Construction Stage which will contain all the relevant financial and technical details of the Rehabilitation/Construction/New Construction
- The Contracting Entity will present a Periodic Payment Report. In this report the following issues will be presented:
    - Indicators related to asset management compliance,
    - Testing and other field verifications parameters,
    - Summary sheets for each group of indicators, payments, balance for payment,
    - Overall Summary sheets, payments, deductions, balance for payment,
    - Total deductions and balance in the custody of the Client/IIU-MPW, after the contractual sequence expirations,
    - Field verifications, test results, interpretation and action required,
    - Issues for further discussion, solutions, line of action,
    - Action related to sub-contractors, in cases of their engagement to comply with the deficiencies which the Contracting Entity has not fulfilled,
    - Notes and Observations of the Monitoring/Supervision Consultant,
    - Notes and Observation of the Client/IIU-MPW

Prior to handover at the end of the Rehabilitation/construction, the Contracting Entity will have to demonstrate that minimum Levels of Service have been achieved and report the results, among others but not limited to:

- Visual survey,
- IRI survey,
- FWD survey,
- Skid Resistance Survey,
- Video Camera Survey,
- Specialized equipment, GPS, Video camera and Database Management System will be used in order to register the results of the studies.

In addition, this Periodic Payment Report will include the information collected from the video recording equipment, GPS and database management system, including pictures, in order to document all non-compliances.

This report presents the level of service and the non-compliance reached by the Contracting Entity, with the acceptance and recommendation of the Monitoring/Supervision Consultant for approval.

- Prepare Final Rehabilitation/construction Completion Report which will contain all the relevant financial and technical details of this stage.
- Prepare Final Completion Report of the project before. transfering to the Government.
- Review and approve a detailed inventory including bridge details, drainage structures, traffic signs and basic alignment details and reconcile them with the information indicated in the "As built drawings", all prepared by the Contracting Entity.
- For each completed part for which a "taking over certificate" (if applicable) has been issued, inspect the works at least 3 times after the construction, noting and advising the Contracting Entity of outstanding defects (if any) for attention and completion before the end of the period.

- Make a presentation to the Client/IIU-MPW/ World Bank in "Power Point" format as and when needed, depicting the salient activities at site and progress supported with photographs and charts.
- Support the Contracting Entity in preparing layout drawings (by reviewing and commenting) of existing surface water drainage systems, showing dimensions and depths and making recommendations for overall construction.

Note: For verification purposes the Monitoring/Supervision Consultant should follow the guidelines and standards as follows:

- For verification of the fulfillment of level of service during detailed design stage, the Monitoring shall follow the procedure established in "Guideline for Design of Pavement Structure – AASHTO 1993". If the design does not fulfill the standards, then the Monitoring/Supervision Consultant must reject the designs and request from the Contracting Entity a new design which meets the standards of AASHTO 1993.
- For verification of the fulfillment of level of service during construction, the Monitoring/Supervision Consultant shall follow the procedure established in the AASHTO Highway Construction 8thedition and in the American Society for Testing and Materials Standard. In these documents, the procedure to follow in field and in laboratory, the total amount of testing to be carried out in 1 km road section, the parameters and values to be evaluated and the minimum and maximum allowed during each inspection are presented.
- For road markings and road signs, the Liberian Road Signs and Road Markings Standards, June 2017 will be used.

- The Monitoring/Supervision Consultant shall review periodically the assessment of compliance and confirm the fulfillment of requirements as per Annex A. Testing equipment will be provided by the Contracting Entity and will be done by the Contracting Entity under supervision of the Monitoring/Supervision Consultant.

- The Monitoring/Supervision Consultant shall assist with the collection, organization and management of the Client/IIU-MPW's program for road data collection on pavement durability measures including IRI, FWD, Skid Resistance and visual inspection; checking of collected data for accuracy and completeness and analysis of the collected data against the prescribed service level performance measures.

- The Monitoring/Supervision Consultant shall review any claim for compensation in respect of overloading, after approval of a detailed, comprehensive plan for the axle load survey, collection of data, comparison with the traffic counting included in the Terms of Reference of Contracting Entity and proven deviation of more than 15%. The Monitoring/Supervision Consultant shall recommend to the Client/IIU-MPW if the Contracting Entity is entitled for compensation.

- The Monitoring/Supervision Consultant shall review the price adjustments during this stage and recommend to the Client/IIU-MPW for approval those adjustments which are justified.

4.3.2 Part D. Other Requirements

- **Hand back Conditions:** Three months prior to the Expiry Date (or in the case of Termination as soon as practicable following the issue of a Termination Notice) the Monitoring/Supervision Consultant shall inspect the Project Road to carry out a survey and assess whether the Project Road has been, and is being, corrected of all defects in accordance with satisfying with the Hand back Conditions. The Monitoring/Supervision Consultant shall notify the Project Manager and the Road Manager of the time, date and venue of such inspection and verification. If any tests are required these will be carried out at the Contracting Entity's cost for this purpose. Any failure to comply with the Hand back Conditions shall be repaired or rectified by the Contracting Entity at its cost and expense. A subsequent test will be

held 1 months before the Expiry Date. The requirements are set out in Clauses 66-70 of the Contract Agreement.

- **Termination:** The Monitoring/Supervision Consultant shall, in the presence of a representative of the Contracting Entity, inspect the Project for determining Service Levels compliance by the Contracting Entity and, if required, cause tests to be carried out at the Contracting Entity's cost for determining such compliance. The Monitoring/Supervision Consultant shall make a report in reasonable detail and send it forthwith to the Client/IIU-MPW and the Contracting Entity on cost and expenses which will be incurred to carry out such repair and rectification.

- **Determination of costs and time:** The Monitoring/Supervision Consultant shall determine the costs including the negative scope of work and/or their reasonableness that are required to be determined in accordance with Contract Agreement.

  The Monitoring/Supervision Consultant shall determine the period, or any extension thereof, that is required to be determined in accordance with Contract Agreement.

- **Assistance in Dispute resolution:** When called upon by either Party in the event of any Dispute, the Monitoring/Supervision Consultant shall mediate and assist the Parties in arriving at an amicable settlement. In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Contract Agreement, the Monitoring/Supervision Consultant shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

- **Other duties and functions:** The Monitoring/Supervision Consultant shall perform all other duties and functions specified in the Contract Agreement including advising the Client/IIU-MPW on any Change in Scope.

4.3.3 Part D -2 Network Information, Data Collection, Analysis and Services Applicable to the Construction.

4.3.4 Responsibilities, duties and obligations of the Monitoring/Supervision Consultant

- Based on the Road Asset Management Systems developed by the RMMU, the Monitoring/Supervision Consultant shall assist the Client/IIU-MPW to populate the database management system.
- The Monitoring/Supervision Consultant shall support the Client/IIU-MPW (and the Project Manager) during the implementation of the Project Management system, with personnel capable to upload, control, visualize and manage all the documents including the bidding documents, proposals, contract, reports, meeting documents, etc, as well as its link with the elements of the road and the status according to the respective work schedule.
- The Monitoring/Supervision Consultant shall assist the Client/IIU-MPW in the collection and revision of the basic line data (existing data) of the Project. This review shall be completed within six (6) months from the commencement of this contract.
- The Monitoring/Supervision Consultant shall summarize the outcomes of this review, as a separate annex, in the monthly report to the Client/IIU-MPW.

The principal responsibilities of the Project Manager/Team Leader of the MC shall include, but not limited to:

- Recommending the Contracting Entity’s subletting parts of the work;
- Recommending the replacement of any of the Contracting Entity’s Key Personnel;
- Recommending approvals for the Contracting Entity insurances;

- Clarifying any queries on the Contract Data;
- Recommending the proposed centre-line reference levels for the roads as proposed by the Contracting Entity or;
- Recommending approvals of the Contracting Entity program and updates thereof;
- Extending the dates for achieving compliance with Service Level Criteria if warranted by the occurrence of unforeseen events or by the issuance of changes to the contract;
- Attending Management Meetings and recording the proceedings thereof;
- Responding to requests for contract changes as made by either the Contracting Entity or the Client/IIU-MPW;
- Checking the Contracting Entity work, notifying the Contracting Entity of any defects found and requesting additional testing considered as necessary;
- Quarterly verification of Service Levels achieved during the construction for performance evaluation purposes;
- Assessing quotations provided by the Contracting Entity or for carrying out variations and instructing variations;
- Checking the Contracting Entity payment's requests and recommending for the amounts due to be paid to the Contracting Entity;
- Determining the justification for Emergency Works and the issuance of Work Orders in respect thereof;
- Recommending the completion of the works and issuance of Taking Over certificates;
- Recommending the payment due upon termination of the contract;

- The Preparation and submittal of a Performance Program no later than at the Start Date. The Program will show the proposed and approved sequence presented by the Contracting Entity in which he will design and carry out the Works and Services.
- The Review and recommendation for approval (either in total or part by part) of the detailed design for construction, in accordance with the Contract documents including the reviewing of detailed specifications and drawings in compliance with Guideline for Design of Pavement Structures – AASHTO 1993 and/or American Society for Testing and Material 2001 – ASTM. The Monitoring/Supervision Consultant will review and approve all required construction details with associated drawings necessary for the construction, prior to commencing of any part of the related Works. The detailed designs will be based on the need to implement all activities to achieve the engineering parameters/service levelsspecified in the Contract documents.
- The development (together with the Contracting Entity) of contingency plans for necessary protection/diversions or otherwise and incorporation of safeguards to protect the existing services against damage or destruction during construction.
- Together with the Contracting Entity, to provide a Quality Assurance Manual (QAM) that describes the specific arrangements under this form of PPP, to be implemented by the Contracting Entity and verified by the Project Manager during the contract period in order to achieve the engineering parameters, specified requirements and service levels of the work described by the technical specifications and quality standards. It is expected that to achieve the quality objectives the QAM would need to consider the following:
- The method of construction statement for each item of work. The statement will describe the procedure of construction/construction, acceptance criteria for materials and work, laboratory and field tests, stages and frequency of tests as a means of internal quality control and specific equipment he will provide for field and laboratory testing.
- Flow diagram depicting the Contracting Entity's internal control mechanisms to deliver the work in compliance with the specifications.
- Stages of intervention expected from the Project Manager's Team and facilities that will be provided by the Contracting Entity for verification.
- Procedure for rectifying defective works.

- Forms for laboratory and field tests, Requests for Inspection and other related forms.
- The Project Manager will, on their part, prepare a Quality Management System (QMS) in harmony with the QAM. The Project Manager will provide all necessary assistance to the Contracting Entity to ensure harmony in the testing and control procedures stated in both documents
- Check systematically the works progress and collect all data necessary to assess the impact of the works on road conditions, including traffic data.
- Conduct testing on materials and finished products to verify the quality of the services before approval of payment certificates for payment by the Client/IIU-MPW.
- Overview and approve the necessary signaling and demarcation of work zones and bypasses by the Contracting Entity to ensure their sufficiency for safety of road users, including non-motorized road users and pedestrians.
- On completion of an agreed part or unit of work, the Contracting Entity will prepare an implementation verification report, informing the Monitoring/Supervision Consultant that a particular part of the work has been completed to the required specifications and level of service, seeking his approval and recommendation to the Client/IIU-MPW for the associated payment, to be based on a given or pro-rata lump sum payment.
- Review the following reports of the Contracting Entity as described in their contract, namely: Inception Report; Design Standards Report; Materials and Pavement Report; Final Design Report, Draft & Final Temporary Traffic Management; Road signs and road markings design report; Detailed design drawings; Bridge design report; Environmental, Health and Safety (EHS) Risks Mitigation and Management Plan; Quarterly construction report; Quarterly Environmental, Occupational Health and Safety report; Quarterly Community engagement, health outreach, road safety report; Quarterly traffic management report; Quarterly data collection report; As built drawings; Final completion report – construction phase; Emergency Works report; End of Contract Handover report; Final Report.
- Organize and conduct monthly site meetings and such special purpose meetings organized as necessary, for traffic management, shifting and relocating utilities, removal of obstructions and encroachments as and when needed.
- Approve the Traffic Action Plan presented by the Contracting Entity, regarding the actions required (e.g. Notification of the Public through mass-media and television) for smooth progress of the works and for minimal disruption to traffic and advise the Client/IIU-MPW on the actions required to notify road users about this plan action.
- Assist the Client/IIU-MPW in resolving any claim or dispute as the result of the civil works contract and to make recommendations thereon, including possible recourse to the Disputes Resolution Board (DRB).
- Review the work program of the Contracting Entity as amended, from time – to – time.
- Submit requests for extension of the dates for achieving compliance with Service Level Criteria when warranted by the occurrence of unforeseen events, or by the issuance of changes to the contract;
- Check the Contracting Entity's accounts, invoices, claims and other statements concerning arithmetical errors and compliance with the contract, and if required correct them thereof;
- Monitor the Contracting Entity in all matters concerning environment, safeguarding and care of the Works and if required, request from the Contracting Entity the necessary lights, guards, fencing and watching;
- Direct the Contracting Entity to carry out all such works or to do all such things that the Project Manager considers necessary to avoid or to reduce the risk in case of an emergency affecting the safety of life or of the Works or of adjoining property;
- Become thoroughly familiar with the bid and contract documents for application under a PPP environment.

- Materials survey: Conduct joint examination of quarry sources and borrow pits and witness field and laboratory tests for verification with the specified qualities.
- Survey data checking: Centerlines, structures, earthworks setting out, invert levels and alignment of underground utilities, kerbs, walkways, covers, gratings and control benchmarks. Sufficient topographical survey data will be checked to ensure complete compatibility with Contracting Entity's working drawings.
- Pavement design confirmation: Notwithstanding the minimum prescribed pavement layer thicknesses given in the Specifications, the pavement design provided by the Contracting Entity shall be confirmed for a life span of 6 millions ESALs at end of construction and 3 million at handover.
- Verification and agreement to the Program of Performance to be provided by the Contracting Entity not later than his start date that shows the proposed sequence in which the Contracting Entity will design and carry out the Works and Services.
- Review of specifications, rates and prices quoted by the Contracting Entity for items under any "Provisional sums" and make recommendations, concerning their acceptance, to the Client/IIU-MPW.
- The Monitoring/Supervision Consultant will ensure proper implementation of environment impact mitigation measures relevant to Liberia, proposed by the Contracting Entity.
- The Project Manager will ensure implementation of the Republic of Liberia Policies related to resettlement matters, with the assistance of the Client/IIU-MPW.

4.3.5 Relocation of utility services and removal of encroachments

- In conjunction with the Contracting Entity, the Project Manager will oversee a survey of existing utility services and encroachments within the right-of-way (ROW) and liaise closely with responsible authorities concerned, any proposed relocation of such services. Detailed plans and proposals will be drawn up for their relocation only if the scope of the Contract is adversely affected. All official dealings with any service agency shall be done through the Client/IIU-MPW.
- Where practical, the Project Manager will assist the Contracting Entity in ascertaining, from the relevant service authorities, the layout and nature of existing services, both above-ground and under-ground and together shall develop contingency plans for necessary protection/diversions or otherwise and incorporate safeguards to protect the existing services against damage or destruction during construction.

4.3.6 Monitoring/Supervision Consultant's Representative on Site

The Monitoring/Supervision Consultant shall undertake full time project administration during the course of the contract and shall appoint a Project Manager acceptable to the Client/IIU-MPW, as its representative, for the on-site construction monitoring of the project; and

The Monitoring/Supervision Consultant shall notify in writing, the representative and the Contracting Entity, about the duties and limitations of authority delegated to the Project Manager, with copy to the Client/IIU-MPW.

4.3.7 Contract Preliminaries

The Monitoring/Supervision Consultant shall review the qualifications of the proposed key management personnel of the Contracting Entity and make appropriate recommendations to the Client/IIU-MPW;

The Monitoring/Supervision Consultant shall receive from the Contracting Entity, check for compliance with contract requirements and recommend for approval, all performance guarantees,

insurance certificates or policies and guarantees relating to the contract, before submitting them to the Client/IIU-MPW for acceptance.

4.3.8 Works Program

The Monitoring/Supervision Consultant shall:

- Review the program submitted by the Contracting Entity for the execution of the Works to establish whether the methods, arrangements, order and timing of the activities are realistic and coherent, in relation to the conditions pertaining to the Site. In particular, the Monitoring/Supervision Consultant shall examine the relative timing of initial construction works to ensure that, as far as is practicable, the Contracting Entity is able to meet the required Service Levels as specified in the timetables for compliance (Annex A) with the contract specifications.
- Identify from the approved program the information needed by the Contracting Entity for the execution of the Works and ensure that such information is made available to the Contracting Entity in a timely manner. The requirement for standard drawings and information relating to the drainage works should be given adequate consideration.

4.3.9 Surveying, Setting Out and Measurement

Although the Contracting Entity bears ultimate responsibility for the design of the works, the Monitoring/Supervision Consultant is required to agree and approve reference levels for road centerlines as proposed by the Contracting Entity, in order to assess whether, once achieved, such levels will be adequate to ensure the long-term durability and stability of the road.

Control points will be established by the Contracting Entity, and checked by the Monitoring/Supervision Consultant, so that road levels can be accurately checked against the reference values during the course of the contract.

The Monitoring/Supervision Consultant shall:

- Check all alignment and elevation control provided by the Contracting Entity;
- Check all setting out of the works undertaken by the Contracting Entity; and
- Carry out checks on centerline levels twice per year, at times determined by the Project Manager during the course of the contract, to establish compliance with the tolerance given in the Service Level criteria.

4.3.10 Management Meetings

The Monitoring/Supervision Consultant shall:

- Arrange a schedule of management meetings, site inspections and other job conferences in liaison with the Contracting Entity and notify those expected to attend. In arranging these meetings, he is expected to maintain and circulate minutes thereof;
- maintain liaison with the Contracting Entity - principally through the Contracting Entity's Road Manager, and give assistance in the understanding and interpretation of all aspects of the contract documentation; and
- Work closely with IIU staff to ensure that as much knowledge and experience is passed on. This will be achieved through meetings in Monrovia. The Monitoring/Supervision Consultant will be expected to make presentations to explain the systems and procedures established on site for measuring the Contracting Entity's performance and general contract management.

4.3.11 Review of Contracting Entity's Performance, Inspection and Tests

The Monitoring/Supervision Consultant shall:

- Conduct on-site observations of the work in progress to determine if the work is proceeding in accordance with the construction contract schedule, and that completed work conforms to the construction contract drawings and specifications;
- Inform the Contracting Entity when work is to be corrected or rejected or to be uncovered for observation, or special testing, inspection or approval;
- Verify that the Contracting Entity conducts sufficient laboratory and field tests to control the quality of the works, and that the Contracting Entity maintains adequate records thereof;
- Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, and record the outcome of these inspections and report as appropriate;
- Verify that selection and use of materials is in accordance with the specifications.
- Establish procedures, criteria, and oversee testing carried out by the Contracting Entity to verify the quality of the construction materials; and
- Conduct quarterly verification of Service Levels, as reported in the Contracting Entity's quarterly performance statements, in collaboration with the Contracting Entity's Quality Control Unit.

4.3.12 Review of Technical Documents submitted by the Contracting Entity

The Monitoring/Supervision Consultant shall:

- Review all documents for the design of the works issued by the Contracting Entity and recommend approval or disapproval within a period not exceeding 7 days following receipt. The Monitoring/Supervision Consultant shall liaise with the Contracting Entity to resolve any issues as quickly as possible. The Contracting Entity shall not commence works prior to receipt of approval from the Project Manager;
- Provide interpretations necessary for the proper execution and progress of work, with reasonable promptness; and
- Provide written decisions within a reasonable time, on all claims, disputes and other matters in question relating to the execution or progress of work or the interpretation of the construction contract documents.

4.3.13 Modifications

The Monitoring/Supervision Consultant shall:

- Consider and evaluate the Contracting Entity's suggestions for modifications in drawings or specifications and report them to the Client/IIU-MPW with recommendations;
- Examine the Contracting Entity proposals for changes and provide recommendations to the Client/IIU-MPW for approval when changes affect cost. Changes which do not affect cost or quality may be approved on-site and recorded in the monthly progress reports. Such changes shall be affected by written orders issued by the Monitoring/Supervision Consultant.

4.3.14 Records

The Monitoring/Supervision Consultant shall:

- Maintain at the project site orderly files for correspondence, reports of site meetings, product and material submissions, reproductions of original construction contract documents including all addenda, variation orders, site instructions, information and drawings issued subsequent to the start of works contract, as well as Monitoring/Supervision Consultant's clarifications and interpretations of the contract documents, progress reports and other related documents;
- Keep a diary or log book, recording the Contracting Entity activities on the job site, including hours, weather conditions, data relative to questions of extras or deductions, list of visiting officials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and
- Maintain a set of drawings ("as-built" drawings) recording all details of the work as actually executed with reference to chainage along the roads.

4.3.15 Payment Certificates

The Monitoring/Supervision Consultant shall review applications for payment made by the Contracting Entity in accordance with the Conditions of Contract. Upon a review and within a maximum of two weeks of receipt from the Contracting Entity, the Monitoring/Supervision Consultant shall forward six (6) copies of the applications to the Client/IIU-MPW together with recommendations regarding payment. The Client/IIU-MPW shall then approve the applications, taking into account the recommendations made by the Monitoring/Supervision Consultant and arrange for payment to be made.

With respect of any Emergency Work approved, the Monitoring/Supervision Consultant shall ensure that each application details the actual quantities and value of work completed to date compared with the total billed quantity and unit rate for each item, in accordance with the Contract. The Monitoring/Supervision Consultant shall also ensure that applications properly account for payments due to the Contracting Entity, for:

- Construction Works;
- Milestone payments during construction period for environmental, health and social activities;
- Milestone payments during construction period for maintenance of access road and completed paved sections;
- Emergency Works;
- Other payments to which the Contracting Entity may be entitled, and
- Deductions, discounts and retention including all noncompliance presented in the Periodic Payment Report.

4.3.16 Completion of Construction Works

The Monitoring/Supervision Consultant shall:

a. inspect the works in the company of the representatives of the Client/IIU-MPW, the Contracting Entity and subcontractors if any, prior to the handing over of any section of works;

b. prepare a final rejection list of items to be completed or replaced, together with a time schedule for the remedying of the same;

c. verify that all items on the final rejection list have been completed or corrected;

d. prepare verifications and recommendations to the Client/IIU-MPW, for approval of all as-built drawings and

e. After completion of construction works, provide written confirmation that the works have been completed in accordance with the requirements of the contract, plans and specifications, and issue a Certificate of Completion of the Works for that section.

4.3.17 Compliance Payments and Liquidated Damages

Compliance Payments are made according to Service Level requirements, while Liquidated Damages are applied in the case of non-compliant delays with required Design and Construction works. The Monitoring/Supervision Consultant shall review and evaluate the liquidated damages in line with the ***civil works contract conditions*** and or determination of payment reduction and recommend to the Client/IIU-MPW the amounts to be deducted from payment and the procedure to follow.

4.3.18 Determination of Payments Rehabilitation/Construction

These will be made quarterly on the basis of milestone payments for

a) Each 5km section of substantially completed paved road construction
b) Completion of Environmental, Health and Social activities
c) Satisfactory maintenance of access road.

- The Monitoring/Supervision Consultant shall execute additional surveys, special inspections and/or tests;

4.3.21 Training

The Monitoring/Supervision Consultant will contribute actively to the learning process of Government staff and the personnel of Contracting Entities in the use of database system, document management system and all parameters included in the OPRC Projects in Liberia. This aspect constitutes an essential element of the Monitoring/Supervision Consultant's assignment and should be complied with through the organization of formal training sessions and workshops.

The IIU will assign up to 3 (three) engineers that will follow all the stages of the Project. Such engineers will have to be trained "on-the-job" by the consulting firm through transfer of technological knowledge on the main functional characteristic of the process. None of the costs and expenses related to those trainees will be borne by the Monitoring/Supervision Consultant.

5 REPORTING

The Monitoring/Supervision Consultant will prepare and submit the following reports and documents, in the English language in an approved or prescribed format. Three (3) hard copies and one (1) soft copy in digital format on CD of each of the listed reports shall be sent to the Client/IIU-MPW and two (2) hard and one (1) soft copy or E-mail directly to the World Bank in lieu of a soft copy.

1. **Inception Report**.: This will summarise the Monitoring/Supervision Consultant's and Contracting Entity's state of mobilisation, Contracting Entity's obligations, records of site meetings and the proposed site communications procedures and record keeping, to be submitted within 2 weeks of commencement of works.

2. **Design Review Report**: This report will give a description of the review and confirmation of the adequacy of all aspects of the design of the bridge, pavement and units of accommodation, etc. and the associated contract drawings. While this might take the form of interim design reviews it is also expected that there will be a final design review report that integrates any interim reporting into a final document.

3. **Monthly Progress Reports:** The reports will provide a brief, but comprehensive end-of-month progress assessment and will include tabulated and graphical representations of physical and financial progress, compared with the Work Programmed and Cash Flow Forecasts, relevant photographs and details of impediments to the Works and proposals for overcoming them. The reports shall include information on Contracting Entity's plant, equipment and staffing, weather conditions at the site of the works, accidents on site and any other relevant details. Reports shall be submitted within the first week of each succeeding month.

4. **Quarterly Progress Report: New Construction Stage:** This report shall include: the historical background of the Project; a brief description of actual versus planned progress; problems encountered and resolutions; and comments on the quality of work and Contracting Entity performance. The reports shall include graphs or charts, showing physical progress of initial construction and data, regarding the current financial status of the contract, including a comparison of the contract amount and the estimated total cost of completion, based on an up-to-date appraisal of actual versus estimated quantities and unit prices as amended. The reports shall include color photographs showing completed work and construction activities undertaken during the relevant reporting period.

   Each quarterly report will contain a section devoted entirely to an assessment of the impact of accumulated delays, if any, in the execution of initial construction works and a projected date for compliance with required service levels if this has not already been achieved. In the event that the projected date is later than a revised date which will result from approved time extensions, the report will include an evaluation of a Contracting Entity-proposed plan for corrective measures to be implemented, to increase the rate of progress in order to meet the required targets. In addition, the effect of delays on the cost and timing of the Monitoring/Supervision Consultant's activities should also be assessed.

   The report shall also discuss compliance or non-compliance with Service Criteria and the penalties that have / have not been applied on the Contracting Entity's certificate for the quarter. The reasons for lack of compliance and the corrective measures being taken by the Contracting Entity should be clearly explained.

   Each report shall contain a section devoted to reporting the status of Emergency Works and Work Orders issued to the Contracting Entity, detailing the dates of notification and subsequent actions

and the time and cost effects as assessed, where appropriate. The report should also discuss the impact of the project on road use and any feedback obtained from road users.

This report shall be submitted no later than the tenth day of the first month in the following quarter.

5. **Quarterly Progress Report – Consultancy**: This report will summarize the Monitoring/Supervision Consultant's staff activities, problems if any with solutions adopted, financial statements for the Consultancy Agreement and any other relevant information considered necessary in respect of the services delivery. This report shall be submitted no later than the tenth day of the first month in the following quarter.

6. **Periodic Payment Report:** This report will summarize the Periodic Payment Report including the fulfillment of all level of service and the non-compliance carried out during the period of three months. The Monitoring/Supervision Consultant will review and approve the periodic payment report submitted by the Contracting Entity based on the measures done by the Monitoring/Supervision Consultant periodic.

7. **Accident Reports**: A report of the circumstances of any significant accidents or any other incident affecting road safety, occurring on the site shall be forwarded to the Client/IIU-MPW with all due dispatch.

8. **Claims Reports**: A report detailing the Project Manager's assessment of each claim notified by the Contracting Entity shall be prepared and submitted to the Client/IIU-MPW.

9. **Final Completion Report: Rehabilitation/Construction Stage:** This report will address all aspects of the Construction implementation, including financial summaries, suggestions and recommendations, design and construction methods, technical specifications, changes in Conditions of Contract and in road maintenance practices. A set of 'as-built' Drawings in digital format on Memory sticks containing all the information contained in the Final Report will be prepared and submitted to the Client/IIU-MPW and the World Bank, within 8 weeks of the Construction/New Construction Stage completion.

10. **Final Report:** Upon completion of the contract, the Monitoring/Supervision Consultant shall prepare a final report which shall highlight all major points of interest that arose during the contract. The report will also include the summary of the type, quality, quantities and sources of materials used on the project; Contracting Entity's plant and personnel; problems encountered and solutions employed; changes made by the Contracting Entity in design and specifications and the reasons thereof; a breakdown of Contracting Entity's performance in respect of the Service Levels Criteria for maintenance services; a breakdown of the final cost of the contract item by item; a summary of contract changes and expenditure of provisional sums and contingency sums. The completed As-built drawings shall form an integral part of the Final Report. The report will also include all financial, technical and management information as well as calculations of cost benefits achieved through the project life. Six copies of the Final Report shall be submitted within 30 days after issuing the final Certificate.

6 TIMEFRAME FOR COMPLETION OF THE ASSIGNMENT

The services shall be carried out **within 48 (Forty-Eight) months after the award of the contract,** plus of 12 months defects Liability period during which the Monitoring/Supervision Consultant's key professional staff team shall spend their time on this assignment in Liberia as agreed under the assignment, with necessary technical and engineering support from the head office of the firm.

It is important to remark that the during as 60 months, the duration of the main activities or stages of this project are as follows:

- Design and Mobilization Period: 5 months
- Rehabilitation/Construction Works Period: 43 months.
- Defects Liability Period: 12 months

7 EQUIPMENT REQUIRED FOR THE MONITORING/SUPERVISION CONSULTANT

7.1. LABORATORY EQUIPMENT – OTHER EQUIPMENT

The Contracting Entity will install a soil and materials laboratory. This laboratory shall be shared with the Monitoring/Supervision Consultant for those tests which require sophisticated and specialized equipment. The Monitoring/Supervision Consultant will be responsible for personnel, material and procedure to carry out tests to evaluate compliance with the level of services.

The list of the minimum equipment, supplied and maintained by the Contracting Entity, required for the sole use of the Project Manager is:

- Topographic Equipment including total station, auto level, tapes and accessories. No. 2 (One set for the Consultant and One set for the Contractor)
- CBR equipment.
- Dynamic Cone Penetrometer (DCP)
- Casagrande Set (Atterberg Limits)
- Soil Classification
- Sieves and Granulometry Test Equipment.
- Proctor Equipment
- Sand Replacement Equipment.
- Pycnometer
- Marshall Equipment
- Asphalt Penetration Equipment
- Abram`s slump cone + other concrete testing requirements
- Additionally, the Monitoring/Supervision Consultant shall carry out performance tests on quarries, asphalt plant, asphalt mixture, aggregates, according to the specifications of "Guidelines of Pavement – AASHTO 1993" and following the procedures of ASTM (American Society for Testing and Materials Volume 4 of 2001).

The frequency and quantity of this test will be based on the AASHTO and ASTM recommendations for each road section rehabilitated and/or maintained by the Contracting Entity. All the parameter must fulfill the level of service required in the TOR of the Contracting Entity.

7.2. ROAD ROUGHNESS AND DURABILITY

New measuring equipment for Road roughness (Riding comfort) and durability (namely –Profilometer and Falling Weight Deflectometer) shall be purchased by the Contracting Entity, and be used by the Monitoring/Supervision Consultant, at the Monitoring/Supervision Consultant request. The Contracting Entity is allowed to use the same equipment for his own Quality Control purposes, as well. The Contracting Entity shall maintain properly this equipment at all times. Whenever requested by the Monitoring/Supervision Consultant, the Contracting Entity shall operate this measuring equipment, under the supervision and instructions of the Monitoring/Supervision Consultant, at the roads sections

indicated by the Monitoring/Supervision Consultant. The results of these measurements shall be the property of the Monitoring/Supervision Consultant.

7.2.1 FALLING WEIGHT DEFLECTOMETER (FWD): The required Falling Weight Deflectometer (FWD) should be Impulse Load Device in accordance with ASTM D4694. This device loads the pavement by dropping a known mass through a known distance simulating the effect of a passing wheel load and measuring the response of the pavement. No alternative equipment type will be accepted.

Vertical deflections are measured in the outer wheel path at the center of the applied load and at various distances away from the load. The procedure to measure the deflections will meet the requirements of American Society for Testing and Material 2001 (ASTM Standard). The equipment must be calibrated/validated as per the manufacturer's recommendations. This parameter will be measured every six months in order to evaluate the compliance with the required Level of Service.

Methodologies for Durability Measures

The deflection of a road is taken to be an indication of its load carrying capacity. It will be checked at road sections selected by the Project Manager based on non-destructive (NDT) evaluation. Measurement is carried out with a Falling-Weight-Type Impulse Load device (FWD) according to ASTM D 4694. The FWD measures the vertical deflection response to the surface to an impulse load applied to the pavement surface. Vertical deflections are measured in the outer wheel path at the center of the applied load and at various distances away from the load. At the end of the contract period, the Contracting Entity will transfer the equipment to the Client/IIU-MPW in good working condition.

7.2.2 ROUGHNESS – IRI: The Contracting Entity shall measure the roughness using the method of International Roughness Index (IRI). The equipment required must be a Class 1 precision Profile according to the specifications as defined by ASTM E-950. The measure of roughness will be made in a continuous way in the wheel tracks of each lane of the carriageway, meeting the requirements of ASTM. The equipment must be calibrated/validated as per the manufacturer's recommendations. This parameter will be measured every three months to evaluate the level of service reached by the Contractor.

Methodologies for Road User Service and Comfort

The indicator to be used to determine the road roughness will be the International Roughness Index (IRI), whose measure unit is expressed in meters per kilometer (m/km). For measuring the IRI, a Profilometer that meets the Class 1 precision and bias specifications as defined by ASTM E-950 must be used and other associated ASTM standard for computation and calibration such as E-1448, E-1364, E-1082, E-867 among others. The measure of roughness will be made in a continuous way, in the wheel tracks of each lane of the carriageway with a minimum speed of 25 km/h. The equipment must be calibrated/validated as per the manufacturer's recommendations and from observation during previous use and following requirements of ASTM E-1448, E-1082. At the end of the contract period, the Contracting Entity will transfer the equipment to the Client/IIU-MPW in good working conditions.

The Contracting Entity shall maintain properly the laboratory equipment, FWD and Roughness at all times. Whenever requested by the Monitoring/Supervision Consultant, the Contracting Entity shall operate this measuring equipment, under the supervision and instructions of the Monitoring/Supervision Consultant, at the roads sections indicated by the Monitoring/Supervision Consultant. The results of these measurements shall be the property of the Monitoring/Supervision Consultant.

7.2.3 SKID RESISTANCE

The Contracting Entity shall measure the skid resistance using a MK2 Grip Tester (see picture below) or similar and analyse with applicable software. At the end of the contract period, the Contracting Entity will transfer the equipment to the Client/IIU-MPW in good working condition.



8 PROFESSIONAL STAFF

The professional staff to be provided by the Monitoring/Supervision Consultant shall be sufficient to cover:
The Construction period and
The Handing Over to the Client/IIU-MPW procedures

The timing of the inputs for each professional member of staff shall be in accordance with the agreed program for the services delivery and appropriate to the construction program. The Monitoring/Supervision Consultant shall also provide the necessary support staffs, technical and non-technical, that is needed for the duration of the services.

For the Key Staff evidence of academic degrees earned must be provided in their respective CVs in English language or a translation of the documentation written in a language other than English.

Staff inputs
The expected input for the **key professionals** is estimated to be 136 **person months.** Professionals other than those listed below will not be evaluated in the Monitoring/Supervision Consultant's proposal. In addition, the Monitoring/Supervision Consultant will propose an adequate number of other technical and support staff required to carry out the assignment. Their CVs are not required until commencement of the assignment.

Table 2: Staff Inputs

Key Personnel	Staff inputs (in months) During the Design and Rehabilitation Stage (36mos.)	*Staff inputs (in Months) during the Defect Liability Period (12mos.)
Team Leader/ Project Manager (Civil/Highway Engineer)	43	4
Highway Engineer/Deputy TL/Project Manager	20	12
Bridge/Structural Engineer	18	2
Pavement Engineer/ Management Specialist	10	4
Environmentalist/ Sociologist	10	1
Hydraulic and Drainage Specialist	7	1
Materials Engineer	24	
Quality Assurance Engineer	4	
Total	**136**	**24**

*The Staff inputs will be staggered over the 12 months for DLP

Key Personnel to be provided shall include the following staff:

a) **Team Leader (Designated Project Manager, Highway/Civil Engineer):**
The Team Leader shall be a qualified and registered professional engineer with an academic degree in Civil or Highway Engineering with a master's degree. The Team Leader shall have a minimum of 15 years of experience in supervision of road construction/construction /maintenance and/or experience in highway design and contract administration, of which a minimum of 7 years of experience as Team Leader on supervision of road construction/construction/maintenance projects of a similar nature. He shall have international experience and have worked in developing countries. In addition, the Team Leader shall have proven ability to manage and administer road construction contracts of this nature under General Conditions and/or shall have experience managing, OPRC and/or DBFMT and/or DBT and or DBOT projects. Full command in written and spoken English is mandatory, whilst excellent communication skills are essential. He shall be conversant with Microsoft Office and M.S. Project.

b) **Highway/ Deputy Team Leader:**
The Highway Engineer shall be a qualified professional engineer with an academic degree in Civil or Highway Engineering with specialization in Highway Engineering

or related areas such as transportation or pavement. This professional shall have a minimum of 10 years of experience in consultancy services projects for Highways in Liberia. He shall be conversant with Microsoft Office (Excel & Word), MS Project and road database applications.

c) Bridge Engineer/Structural Engineer:

The Bridge Engineer shall be a qualified professional engineer with an academic degree in Civil Engineering with specialization in Structural Engineering. This professional shall have a minimum of 10 years of experience in design and supervision of highway bridges and structures. Experience in developing countries is desirable. He shall be conversant with Microsoft Office and M.S. Project.

d) Pavement Engineer/ Pavement Management Specialist:

The Pavement Engineer/ Management Specialist shall be a qualified professional engineer with an academic degree in Civil Engineering, with specialization in Highway Engineering or related areas. This professional shall have a minimum of 12 years of experience, of which a minimum of 8 years in Pavement management experience is essential including international experience and experience in developing countries. Experience in OPRC/ DBFMT/ DBT/ DBTM shall be an added advantage. He should be thoroughly conversant with various internationally accepted design methodologies applicable for tropical countries, both flexible and rigid pavement, and fully familiar with international 'best practices." Experience in pavement & sub grade investigations including deflection and roughness tests interpretation, the results and in design of pavement construction & strengthening is a necessity. He must have experience in designing appropriate cost-effective pavements, making best use of locally available materials.

e) Environmentalist/Sociologist:

The Environmentalist/Sociologist shall be a qualified professional with an academic degree in Environmental Management and Social Science Management, Geography, Anthropology, Sociology, Environmental Science or a closely related discipline. This professional shall have a minimum of 8 years of experience working on environmental management and be able to demonstrate a sound knowledge of environmental and social issues (such as evaluating environmental management plan (EMP) or Environmental Impact Assessment (EIA), Social impact Assessment (SIA), and Social Management Plan (SMP), Environment, Health, Social Plan (EHSP)), initiatives and impact assessment and mitigation measures in developing and tropical countries. The specialist shall have proven experience in impact assessment management within the road sector in developing countries and preferably participation in one project related to OPRC / DBFMT / DBOT / DBO type of contract. Fluency in both written and spoken English and ability to communicate ideas freely is essential.

f) Hydraulics and Drainage Specialist:

The Hydraulics and Drainage Specialist shall be a qualified professional engineer with an academic degree in Civil Engineering and with specialization or Master in Hydraulic or related areas. This professional shall have a minimum of 8 years of proven experience in design or construction of water supply, storm water runoff drainage and systems, sewage collection works and associated drainage structures. He shall be conversant with estimating flood discharge together with designing and checking vent way requirements for drains culverts and bridges. He should be

conversant with various internationally accepted design methodologies applicable for tropical countries. He shall be conversant with Microsoft Office and be fluent in both written and spoken English. Experience in developing countries is desirable.

g) Soils/Materials Engineer:

The Soils / Materials Engineer shall be a qualified professional Engineer with an academic degree in Civil Engineering. This professional shall have a minimum of 10 years of experience in highway design or construction/construction projects, or construction/construction supervision, ground investigation and highway laboratory materials testing of which a minimum of 8 years of experience as head of a laboratory conducting routine testing of road construction materials, concrete, asphalt mix and blending soils to control PI values and gradation, knowledge of preparation of asphalt and concrete mix designs and commenting test results statistically using mean value and standard deviation in developing and tropical countries. Fluency in written and spoken English is mandatory.

h) Quality Assurance (QA) Engineer:

The Quality Assurance shall be an academically qualified professional engineer with an academic degree in Civil Engineering with the added specialty of Quality Assurance or Quality Control experience. This professional shall have a minimum of 7 years of experience in managing the QC or QA of roads and bridges construction supervision or roads and bridges construction and maintenance supervision projects which at least 3 years of experience as QC \ QA unit manager of similar projects. (in size and type). Experience in developing countries is desirable.

9 FACILITIES TO BE PROVIDED BY THE MONITORING CONSULTANT

The Monitoring/Supervision Consultant shall provide any other junior personnel such as site assistants, drivers and secretarial staff that are necessary for the proper execution of the services.

9.1 SERVICES TO BE PROVIDED BY THE CLIENT/IIU-MPW

The Client/IIU-MPW will appoint a liaison officer through whom all request for information, guidance and assistance should be addressed. All reasonable assistance will be provided, including liaison with other Client/IIU-MPW departments and access to any relevant data that is not classified as restricted. Other personnel from Client/IIU-MPW's organization to be assigned to the project shall be as agreed during negotiation.

The Client/IIU-MPW will provide the Monitoring/Supervision Consultant, without charge, the following:

- Assistance in obtaining any required customs clearances, visas and any other official permits; transport to project sites, as may reasonably be required;
- Such other support facilities as may reasonably be needed for the expeditious performance of the required services, including pertinent files, documents and working papers.

The cost-of-service connections and water and electricity consumption, as well as watchman and office cleaning services shall be paid for by the Contracting Entity.

9.2 SERVICES TO BE PROVIDED BY THE CLIENT/IIU-MPW THROUGH THE CONTRACTING ENTITY

Through the Contracting Entity's contract with the Client/IIU-MPW, the Contracting Entity will provide, operate and maintain for the Monitoring/Supervision Consultant's use the following:

- Office space for Project Manager and staff,
- Office equipment
- Residential accommodation
- Vehicles:
- Materials testing equipment
- Survey equipment (the survey equipment will be the property of the client)

9.3 Project Manager's Office, Housing and Vehicles:

The following Services and Facilities provided and Maintained by the Contracting Entity throughout the Duration of the Construction Contract

Project Manager's Office, Housing Accommodation and Vehicles

9.3.1 ***General Description:***

The Project Manager's office and housing accommodation shall be located on land purchased by Contracting Entity on behalf of the Client/IIU-MPW in a safe and secure area. The buildings shall be constructed in accordance with the specifications provided. Both office and residences shall be furnished and maintained for the entire duration of the contract. Upon completion of the contract, the entire accommodation complex (office and residences, including furnishings and equipment) shall become the property of the Client/IIU-MPW. The Contracting Entity will establish a laboratory within the project area or nearby and shall be equipped with the necessary equipment required for the successful completion of the project. No separate payment will be made for establishing the laboratory. On completion of the project, the entire laboratory building, and equipment will revert back to the Contracting Entity. The Project Manager shall have access to the laboratory at all times; however, the Monitoring Monitoring/Supervision Consultant shall be responsible for personnel, material, and procedure to conduct test checks. Facilities including maintenance, fuel, oil and spare parts are the responsibility of the Contracting Entity.

The facilities include the purchase of vehicles; ***eight (8))*** diesel operated brand new, 4-wheel drive; 3 SUV (one for use of the Client) and 5 Double Cabin pickups (one for use of the client) as per the enclosed detailed specification shall be procured and maintained by the Contracting Entity for the exclusive use of the Project Manager. On completion of the construction contract, the Monitoring/Supervision Consultant's vehicles shall be handed over in a condition acceptable condition to the Client/IIU-MPW. Delivery time is 60 days from signing of the contract. The

Contracting Entity will provide three hired vehicles to the Project Manager from the date of commencement until delivery of the new vehicles is affected.

The Contracting Entity will provide layout drawing showing the location of the accommodation listed in the bid along with necessary plan, elevation and cross section drawings of each type of accommodation, foundation details, service road, septic tanks, soak ways, sewer manholes, security gates, fencing, car parking, specification of fittings and fixtures, street lighting, drainage and all such details necessary for their proper function. The construction shall commence only after approval from the Client/IIU-MPW (after recommendation for approval from the Project Manager). The accommodation shall be ready for occupation not later than 60 days after signing the contract. Until such time the Contracting Entity shall provide hired accommodation of comparable standards including maintenance specified in the bid.

It should be recalled that the project is for ten years, so all the facilities must be of suitable quality and standards to ensure that they are still in good condition at the end of the contract period.

9.3.2 Monitoring/Supervision Consultant's office accommodation

Note: In a case that the Monitoring/Supervision Consultant needs two offices, because of the work program and location of Contractor's establishments, the Client/IIU-MPW together with the Monitoring/Supervision Consultant shall divide the offices buildings and accommodations, equipment, maintenance of the equipment and other items , in consultation with the CE.

Specification for Monitoring/Supervision Consultant's office: Land for the office shall be purchased by the Contracting Entity. The entire accommodation shall be completed within 60 days of signing commencement of the works. The buildings can be made of hollow concrete blocks or prefabricated with aluminum or galvanized iron roofing sheet with custom made ceilings, suitable for use in tropical and rainy conditions. The vertical clearance from floor to the underside of ceiling shall not less than 2.5 m. The foundation shall be strip footing or concrete raft type. The grade of concrete shall be 20N/mm^2 for all elements. The duties include providing water and electricity for 24 hours and attendance. The whole boundary shall be fenced with minimum 2m high, 3 horizontal layers of barbed wire with barbed coil at top. The concrete pillars supporting the fencing shall be spaced at 3 m centers and shall be resting on concrete bedding 450x450x450. The flooring shall be cement screed finished with PVC tiles. The toilet and kitchen floor shall be finished with ceramic tiles. Two separate septic tanks shall be constructed for office and residence. The walls shall be finished with 2 coats of emulsion and the doors and windows with synthetic enamel. The activity shall include attendance and supply of consumables and replacement of damaged equipment and furniture any number of times. This activity involves construction of office and residential accommodation including furnishing and maintenance as detailed below. In case of delay beyond 60 days the Contracting Entity shall bear the cost of office and residential accommodation incurred by the Project Manager.

9.3.2.1 Office:

1. Land: 0.– 0.35 Ha min.
2. Office floor area including 3 numbers of toilets-300 m^2.
3. Open car park - 220 m^2.
4. Car park with roof: - 125 m^2.
5. Electrical power; 230volt 50/60 Hertz with proper controls and earthed, uninterrupted supply day and night.
6. Toilets attached with office: - 4 nos with shower, European closet, wash basin, water heater, towel rail, soap dish, toilet roll holder and mirror and floor mats.
7. Water; Potable running water for use in toilets and basins, day and night.
8. Overhead water tank: head of water-5metre min; capacity 3,000 litres
9. Septic tank and soak pit: for 25 user capacity with a cleansing period of 3 years. The septic tank shall have air vent with mosquito proofing. The soak pit shall have sufficient soaking area to absorb the effluent from the septic tank without causing ponding and fly nuisance.

9.3.2.2 Furnishing:

i.	Power and light sockets: As per actual approved by the Project Manager	
ii.	Conference table 3x1.2 m—	2 no
iii.	Refrigerator 0.2 m^3 capacity—	2 nos
iv.	Swivel type chair on casters—	5nos
v.	Do Executive type—	4nos
vi.	Computer type table with 2 drawers—	8nos
vii.	Secretary's desk with minimum top area 1.2 m^2 and three lockable drawers, complete with. Swivel type secretary's chair—	3no.
viii.	Chair without arms, but with cushion seat and back	18nos
ix.	Metal filing cabinets with 3 legal size lockable drawers-	3nos
x.	Bookcases with 4 adjustable shelves-	4nos
xi.	Metallic safe for cash and valuables 0.8mx0.5mx0.4m complete with lock and keys. -	2no.
xii.	Microwave oven 0.4 m^3 capacity-	2no.
xiii.	Electric kettle,1litre capacity, cordless type	4nos
xiv.	Ceiling fans or pedestal fans	6nos
xv.	Split unit type air conditioner 1.5 KWH-	6nos

9.3.2.3 **Project Manager's office equipment and supplies**:

The Contracting Entity shall supply the equipment and provide attendance including maintenance, replacements and supply of all consumables and spares. Before placing the supply order, the Contracting Entity shall submit the specifications and proforma invoices for the approval of the Client/IIU-MPW. The equipment to be supplied is:

1. Desk top computer	8nos
2. Lap top computer	4 no
3. Color printer –laser type forA4 and A3 printing	3 no

4. Color printer – laser type for A4 printing 3 no
5. Photo copier for A4 and A3 sizes, continuous printing up to 30 minutes 1 no
6. UPS (Uninterrupted power system) I KVA with surge protector and connected to all desktops 6 no.
7. AASHTO reference" The 27th Edition of standard specifications} for transportation materials and method of sampling and testing (Materials Book) and AASHTO provisional standard 2007 edition. Item code 7-HM-27CDM 2 set.
8. 2002 AASHTO standard specification for highway bridges 17th edition 2 set
9. Digital Camera for office use 2 no.
10. Flatbed Scanner with auto feeder 2 no.
11. Broadband/satellite Internet in 3 office 6no.
12. A BW Laser printer including toners and papers for the duration of the contract. 6no.
13 Binding Machine for Reports with covers, spirals etc. for the duration of the contract. 3no.
14 Office Stationery Requirements (staplers, paper punchers, envelopes, pens, maker pen, power extension cords, notebooks etc. for the duration of the contract.

9.3.3 Residential Accommodation

9.3.3.1 Specification for Residential Accommodation.

Specification is the same as that for office. The Contracting Entity shall prepare the design and obtain approval from the Project Manager before construction commences.

9.3.3.2 *Type and Number:*

1. House Type 1. - 3 bed room type 1 no. min. floor area 140 m^2 for – Team Leader
2. House Type 2. - 2bed room type – 5 nos., min. floor area 110 m^2 for the key personnel
3. House type 3. - 2bed room type – 6 Nos., min. floor area 70 m^2. for Technical support and administrative staff.

9.3.3.3 *Internal fittings:*

- Bath and shower with drain and close coupled flushing European toilet-3 sets for type1 and 2 sets for every Type 2.
- Separate shower and toilet room- 3 sets for type 1 and 2 sets for every Type 2.
- Kitchen sink unit with stainless steel twin basin, draining boards and cupboard Kitchen dresser and fitted cupboards.
- Store with fitted cupboards.
- Cold water pipes from an outside source to the bath, wash basins, showers, toilet and sink units, complete with taps where required.
- Hot water pipes from water heater to the bath, wash basin, showers, toilets and sink units complete with taps.
- Electric lights with shades in all rooms and passages, with plug points in the kitchen, living rooms and all bed rooms. The houses shall be properly wired with necessary earthed and safety relays and controls.
- Good quality mortise lock on all doors with duplicate keys.

- Elevated overhead tank 5,000 l capacity, 5m head min, for all houses with separate gate valves for each house.
- Mosquito curtain netting to all doors and windows and curtains with pelmets for all windows.
- A lockable 6m x 3m garage adjacent to Type 1 with 3 m wide driveway and 150 mm thick wearing course, with turning parking areas.
- Security bars on all external doors and windows.
- 4 m wide steel gate at entrance moving on roller or 2 leaf type supported on butt hinges (Not required if housing is adjoining office in the same compound.)

9.3.3.4 *Furniture and Equipments for houses-see table below.*

Description	Type1/ house	Type2/ house	Type3/ house
Kitchen table(formica top)	1	1	1
Kitchen chair	4	4	4
Dining table for 4 persons	1	1	1
Dining chair	6	4	4
Writing table with 3 drawers	1	1	1
Computer table with swivel type chair	1	1	1
Book shelf	1	1	1
Settee for 3 persons	1	1	1
Easy chairs (matching settee)	3	2	1
4 Plastic chairs & table for garden	1 set	1 set	1 set
Coffee tables	1	1	1
Side board	2	1	1
Living Room standard lamps	2	1	1
Beds, double with inner spring mattress	1	1	0
Beds, single with inner spring mattress	2	2	2
Pillows	8	8	4
Bedside reading Lights	5	4	2
Side tables	4	4	2
Dressing table with mirror	2	2	1
Dressing table stool	2	2	1
Chest of drawers	3	2	1
Bedroom chairs	3	2	2
Bath room cabinet with mirror	3	2	1
Floor rugs	5	4	4
Air conditioner –split-type 12000 BTU/h	4	3	3
Gas or electric cooker with 4 burners, grill and oven & fume hood	1	1	1
Microwave oven min 800 W	1	1	1
Refrigerator min.0.40 m^3 (electric frost free)	1	1	1
Water filter	2	1	1

Description	Type1/ house	Type2/ house	Type3/ house
Deep freezer – min 0.40 m^3	1	1	1
Dust bin metal with lid (outdoor use)	1	1	1
Door mats	2	1	1
Vacuum cleaner(electric)	1	1	1
Ceiling fans	3	2	2
Set of 8 pieces of crockery, cutlery and glass ware	1 set	1 set	1 set
Set of kitchen utensils	1 set	1 set	1 set
Set of pots and pans & oven dishes	1 set	1 set	1 set
Fire extinguisher	1	1	1
Waste basket	5	4	2
Electric blender and liquidizer	1	1	1
Bed sheets	10	8	8
Pillow cases	10	8	8
Blankets	10	8	4

10 Procurement and supply of Vehicles:

The Contracting Entity will procure, and supply eight (8) new vehicles diesel operated 3 SUV (one for use of the Client) and 5 pickups (One for use of the Client) and the rest for the use of the Monitoring/Supervision Consultant, 4-wheel drive vehicles. The Contracting Entity will maintain the vehicles assigned to the Monitoring/Supervision Consultant during the construction period with fuel, spares, attendance and driver. On completion of the contract, the vehicles shall be duly handed over to the Client/IIU-MPW in good working condition as detailed below. Effective from the commencement date, the Contracting Entity must arrange hired vehicles of same standard or better until such time as the newly purchased vehicles are provided to the Project Manager.

A Detailed specification of the listed items are included in the Request for Bids and Draft Concession Contract, and it will cover sufficient items for the effective oversight of the project during the contract.

ANNEX A: COMPLIANCE GRID

As referred to in the Client/IIU-MPW's Requirements to the Contracting Entity, the following activities and engineering parameters/service levels are attached for the information of the Monitoring/Supervision Consultant:

AM Objectives	ID	Performance Measures	Units	Service Level during Construction Period	Measurement / Detection	Inspection / Survey Frequency	Compliance Points Available	Compliance Criteria	Criteria for assigning compliance points
Safety	1.1	Guardrails	AR	Guardrails should be in good or very good condition (See Annex 4)	Visual inspection, condition of guard rails is assessed by assigning a rating (AR) ranging from 0 (Very Good) to 5 (Very Poor) to each discrete length of guard rail located within a continuous one-kilometre road section	Quarterly	6	AR< 2 = 100%, 2 - 3 = 50%, > 3 = 0%	Points are allocated to each one-km road section using the worst (highest) guard rail condition rating recorded on the one-km road section
	1.2	Traffic signs	AR	Traffic signs should be in good or very good condition (See Annex 4)	Visual inspection, condition of traffic signs is assessed by assigning a rating (AR) (ranging from 0 (Very Good) to 5 (Very Poor) to each sign located within a continuous one-kilometre road section	Quarterly	5	AR< 2 = 100%, 2 - 3 = 50%, > 3 = 0%	Points are allocated to each one-km road section using the worst (highest) traffic sign condition rating recorded on the one-km road section
	1.3	Marker posts	AR	Marker posts should be in good or very good condition (See Annex 4)	Visual inspection, condition of marker posts is assessed by assigning a rating (AR) (ranging from 0 (Very Good) to 5 (Very Poor) to each marker posts located within a continuous one-kilometre road section	Quarterly	2	AR< 2 = 100%, 2 - 3 = 50%, > 3 = 0%	Points are allocated to each one-km road section using the worst (highest) marker posts condition rating recorded on the one-km road section
	1.4	Road marking	AR	Road marking should be in good or very good condition (Annex 4)	Visual inspection, condition of road markings is assessed by assigning a rating (AR) (ranging from 0 (Very Good) to 5 (Very Poor) to reflect average condition of road markings located within a continuous one-kilometre road section	Quarterly	6	AR< 2 = 100%, 2 - 3 = 50%, > 3 = 0%	Points are allocated to each one-km road section by considering the average condition of road marking recorded within the one-km road section

AM Objectives	ID	Performance Measures	Units	Service Level during Construction Period	Measurement / Detection	Inspection / Survey Frequency	Compliance Points Available	Compliance Criteria	Criteria for assigning compliance points
	1.5	Road studs	AR	Road studs should be in good or very good condition (See Annex 4)	Visual inspection, condition of road studs is assessed by assigning a rating (AR) (ranging from 0 (Very Good) to 5 (Very Poor) to reflect average condition of road studs located within a continuous one-kilometre road section	Biannually	2	AR< 2 = 100%, 2 - 3 = 50%, > 3 = 0%	Points are allocated to each one-km road section by considering the average condition of road studs recorded within the one-km road section
	1.6	Vegetation control	mm	Vegetation shall be maintained in accordance with service levels specified in Annexes 3(a) and 3(b)	The measure will be done with a ruler measuring the vertical distance between the ground and the highest point of vegetation	Quarterly	3	Compliant = 100% Non-compliant = 0%	Points are allocated to each one-km road section based on assessment of compliance of vegetation within the section to service level requirement
	1.7	Shoulder edge drop, and Pavement and Shoulder width	mm	Height from edge of carriageway to shoulder or shoulder edge drop shall not exceed 50mm Pavement and shoulder width must be at least wide as specified in the contract.	Manual measurement using a metallic measuring tape.	Quarterly	4	Shoulder edge drop < 50mm = 100%, 50-100mm = 50%, > 100mm = 0% Pavement / shoulder width Compliant = 100% Non-compliant = 0%	Points are allocated to each one-km road section using the worst rating assigned to shoulder edge drop or pavement/shoulder width on any sub-section within the one-km road section
	1.8	Road pavement surface skid resistance	LFC	Skid resistance on any 20m section must not be less than 0.46 The average skid resistance on any one hundred meter section must be greater or	Measurement using a Mark 2 Grip Tester Mu Meter. Reading should be taken in each lane along each wheel track, presenting results every 20 m, within each km, along the full road length.	Biannually	8	Skid resistance on any 20m sub-section < 0.46 = 0% Otherwise Minimum skid resistance (average over 100m sub-sections) within a	Points are allocated to each one-km road section based on the worst reading recorded on a 20m sub-section

AM Objectives	ID	Performance Measures	Units	Service Level during Construction Period	Measurement / Detection	Inspection / Survey Frequency	Compliance Points Available	Compliance Criteria	Criteria for assigning compliance points
				equal to 0.53				one-km section FC>= 0.53 = 100%, FC 0.46 – 0.53, 50%, FC<0.46 = 0%	
Comfort	2.1	Roughness	m/km	Maximum IRI value recorded within any one-km section must be less than **3 m/km** Average IRI value for any one-km section must be less than **2.5 m/km**	Measured with a calibrated laser profiler (Class 1 precision and bias specifications as defined by ASTM E-950) with a minimum of two laser units. A laser unit must be positioned on each wheel track. The IRI should be measured every 20 m on both wheel tracks, in each lane, along the full road length. For compliance, one-kilometre section will be used, and compliance assessed on each road lane	Biannually	10	Maximum IRI (on any sub-section) >3 = 0% otherwise Average IRI (on one-km section) <2.5 = 100%, 2.5-3.0 = 50%, >3.0=0%	Points are allocated to each one-km road section based on lane with the worst condition in terms of IRI
	2.2	Surface defect rate (category 1 defects) (See Annex 4)	%	Surface defect rate on any one-km section must be less than **15%**	Visual inspection, measurement of category 1 defects performed using ruler	Biannually	2	Surface defect Cat. 1 <15 = 100%, 15 - 22.5 = 50%, >22.5% = 0%	Points are allocated to each one-km road section by considering the average surface defects recorded within the one-km road section
	2.3	Surface defect rate (category 2 defects) (See Annex 4)	%	Surface defect rate on any one-km section must be **0%**	Visual inspection, measurement of category 2 defects performed using ruler (may also be done by video equipment)	Biannually	5	Surface defect Cat. 2 =0 Compliance points = 100%, >0 - 0.0124 = 50%, >0.0124 = 0%	Points are allocated to each one-km road section by considering the average surface defects recorded within the one-km road section
	2.4	Rutting	mm	There shall not be ruts	Measurement using calibrated laser	Biannually	5	Maximum rut depth	Points are allocated to each

AM Objectives	ID	Performance Measures	Units	Service Level during Construction Period	Measurement / Detection	Inspection / Survey Frequency	Compliance Points Available	Compliance Criteria	Criteria for assigning compliance points
				deeper than 12mm Average rutting of more than **ten (10) mm** shall not be present in any one-km section	profiler or transverse profile logger using laser or ultrasonic sensors. Reading should be collected in each lane and wheel track, presenting results every 20 m, within each km, along the full road length An average value will be calculated per km, using both lanes			(on any 20m sub-section) > 12mm = 0% Average rut depth on 1-km section <10 mm = 100%, 10-15 = 50%, >15 = 0%	one-km road section based on compliance criteria
	2.5	Cracking	(%)	Cracking rate on any one-km section must be **0%** of the pavement surface area	Measurements shall be carried out using video equipment	Biannually	3	Cracking rate=0% compliance points = 100%,0-0.2 = 50%, >0.2 = 0%	Points are allocated to each one-km road section by considering the average cracking rate on the one-km road section
Structural	3.1	Structural capacity: Measurement of Deflection using FWD.	mm	Average central deflection (Do) on any one-km section shall not be greater than **0.6mm**	Specification as defined by ASTM D4694. FWD measurements will be collected every 50 m per lane along the road. Representative deflection on any one-km section shall be the 85th percentile deflection measured (on both lanes) on that section.	Biannually	12	Central deflection <0.6 = 100%, 0.6 -0.7 = 50% >0.7 = 0%	Points are allocated to each one-km road section by considering the average deflection recorded on the one-km road section
	3.2	Bridges	BCI	Bridge Condition Index (BCI) for all bridges should be greater than 70	Visual inspection of bridges in accordance with requirements of table 7 and Annex 4.	Biannually	8	BCI>70 = 100%, 70 - 50 = 50%, <50 = 0%	Points are allocated to each one-km road section based on the worst bridge condition recorded on the road section
	3.3	Culvert condition	AR	All culverts should be in good or very good condition as defined by section 3.4 in Annex 4.	Visual inspection, condition of culverts should be assessed by assigning a rating (AR) (ranging from 0 (Very Good) to 5 (Critical) to each culvert or group of	Quarterly	5	AR< 2 = 100%, 2 - 3 = 50%, > 3 = 0%	Points are allocated to each one-km road section based on the worst culvert condition recorded on the road section

AM Objectives	ID	Performance Measures	Units	Service Level during Construction Period	Measurement / Detection	Inspection / Survey Frequency	Compliance Points Available	Compliance Criteria	Criteria for assigning compliance points
					culvert located at the same point. Specification for condition rating is given in section 3.4 of Annex 4.				
	3.4	Side drains	AR	Side drains should be in good or very good condition as defined by section 3.5 in Annex 4.	Visual inspection, condition of side drains should be assessed by assigning a rating (AR) (ranging from 0 (Very Good) to 5 (critical) to each discrete length of side drain located within a one-km road section. Specification for condition rating is given in section 3.5 of Annex 4.	Quarterly	3	AR< 2 = 100%, 2 - 3 = 50%, > 3 = 0%	Points are allocated to each one-km road section based on the worst side drain condition recorded on the road section
Environmental , Health and Social	4.1	Maintenance EHS Management Plan Reporting	-	Any observance of significant items of unreasonable non-compliance to result in up to 100% loss of available points	Verifiable Training Records submitted with the Quarterly Environmental, Occupational Health and Safety Report	Quarterly	3	Fit for Purpose = 100%; near compliant 75%; Non-compliant = 0%	Points are allocated on a quarterly basis and reflect performance along the whole project scope
	4.2	PPE and safe working	-		Recorded non-conformance with H&SE Plan requirements	Quarterly	2		
	4.3	Labour law and gender	-		Recorded non-conformance with ESMP requirements	Quarterly	1		
	4.4	Pollution control	-		Recorded non-conformance with ESMP requirements	Quarterly	2		
	4.5	Erosion control and natural environment	-		Recorded non-conformance with ESMP requirements	Quarterly	1		
	4.6	Road safety and engagement	-		Recorded non-conformance with ESMP requirements	Quarterly	2		

Example Compliance Calculation

ID	Performance Measures	Points	Description	Ref.	Chainage (km)	0	1	2	3	4	5	6	7	8	9	10	Average Points
1.1	Guard Rails		Worst visual condition rating per km	Annex 4	-	1	1	1	1	1	1	1	1	1	1	1	
			Index	Table 7	PI_GR	1	1	1	1	1	1	1	1	1	1	1	
			% Score	Table 6	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		6	Comp. points	Table 6	-	6	6	6	6	6	6	6	6	6	6	6	6.00
1.2	Traffic Signs		Worst visual condition rating per km	Annex 4	-	2	1	2	1	1	1	1	1	1	1	1	
			Index	Annex 4	PI_TS	2	1	2	1	1	1	1	1	1	1	1	
			% Score	Table 6	-	50%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	
		5	Comp. points	Table 6	-	2.5	5	2.5	5	5	5	5	5	5	5	5	4.55
1.3	Marker posts		Worst visual condition rating per km	Annex 4	-	1.8	0.9	0.3	1.7	1.4	1.9	1.8	1.5	1	1	1.4	
			Highest condition rating	Annex 4	PI_MP	1.8	0.9	0.3	1.7	1.4	1.9	1.8	1.5	1	1	1.4	
			% Score	Table 6	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		2	Comp. points	Table 6	-	2	2	2	2	2	2	2	2	2	2	2	2.00
1.4	Road Marking			Table 7	Centre	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	
			Worst visual condition rating per km	Table 7	Edge	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	
				Table 7	Other	1.50	1.50	1.50	3.00	1.50	1.50	1.50	2.50	1.50	1.50	4.00	
			Average condition rating	-	PI_RM	1.50	1.50	1.50	2.00	1.50	1.50	1.50	1.83	1.50	1.50	2.33	
			% Score	Table 6	-	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	50%	
		6	Comp. points	Table 6	-	6	6	6	3	6	6	6	6	6	6	3	5.45
1.5	Road studs		Worst visual condition rating per km	Annex 4	-	1.7	1.9	1.9	1.5	1.4	1.9	1.9	1.4	1.8	1.8	1.7	
			Highest condition rating	Annex 4	PI_RS	1.7	1.9	1.9	1.5	1.4	1.9	1.9	1.4	1.8	1.8	1.7	
			% Score	Table 6	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		2	Comp. points	Table 6	-	2	2	2	2	2	2	2	2	2	2	2	2.00
1.6	Vegetation control		Vegetation control compliance/	Annex 3	mm	C	C	C	C	C	C	NC	C	C	C	C	
			Index	-	PI_V	0	0	0	0	0	0	5	0	0	0	0	
			% Score	Table 6	-	100%	100%	100%	100%	100%	100%	0%	100%	100%	100%	100%	
		3	Comp. points	Table 6	-	3	3	3	3	3	3	0	3	3	3	3	2.73
1.7a	Shoulder edge drop, and Pavement and Shoulder width		Shoulder edge drop	Annex 4	mm	38.9	38.9	26	70	28.6	28.6	4.3	12.9	14.7	14.7	11.2	
			Pavement/shoulder width	-	-	C	C	C	C	C	C	C	C	C	C	C	
			Index (Edge drop)	Annex 4	PI_ED	1.5	1.5	1.5	2.5	1.5	1.5	0.5	0.5	0.5	0.5	0.5	
			Index (Pav./Sh. Width)	-	PI_PW	0	0	0	0	0	0	0	0	0	0	0	
			Max. Index	-	PI_ED&W	1.5	1.5	1.5	2.5	1.5	1.5	0.5	0.5	0.5	0.5	0.5	
			% Score	Table 6	-	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	
		4	Points	Table 6	-	4	4	4	2	4	4	4	4	4	4	4	3.82
1.8	Skid Resistance		Min. LFC on 20m sub-sections	Table 6	-	0.50	0.49	0.47	0.51	0.51	0.40	0.49	0.53	0.48	0.48	0.47	
			Min. average LFC on 100m section	Table 6	-	0.55	0.47	0.60	0.61	0.64	0.56	0.53	0.60	0.54	0.53	0.51	
			Overall LFC per 1-km section	Table 6	-	0.55	0.47	0.60	0.61	0.64	0.40	0.53	0.60	0.54	0.53	0.51	
			Index (PI_F)	Annex 4	PI_F	1.71	2.82	1.01	0.87	0.46	3.79	1.98	1.01	1.85	1.98	2.26	
			% Score	Table 6	-	100%	50%	100%	100%	100%	0%	100%	100%	100%	100%	50%	
		8	Points	Table 6	-	8	4	8	8	8	0	8	8	8	8	4	6.55
2.1	Roughness		Max. Sub-section IRI	Table 6	m/km	2.30	1.30	2.00	1.30	2.70	2.40	2.40	1.60	2.80	1.30	2.90	
			Average IRI	Table 6	m/km	2.30	1.00	1.20	1.00	1.80	1.70	2.10	1.20	1.70	1.30	2.60	
			Overall IRI for 1-km section	Table 6	m/km	2.30	1.00	1.20	1.00	1.80	1.70	2.10	1.20	1.70	1.30	2.60	
			Performance Index	Annex 4	PI_E	1.88	0.82	0.98	0.82	1.47	1.39	1.71	0.98	1.39	1.06	2.12	
			% Score	Table 6	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	
		10	Points	Table 6	-	10	10	10	10	10	10	10	10	10	10	5	9.55
2.2	Cat. 1 surface distress		Bleeding (Med. Severity)		m2	29.20	15.00	8.50	18.80	3.90	9.60	16.10	13.10	10.00	17.90	10.00	
			Bleeding (High Severity)		m2	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Ravelling (Med. Severity)		m2	13.00	24.00	14.00	18.00	24.00	23.00	13.00	14.00	20.00	17.00	13.00	
			Ravelling (Hig. Severity)		m2	13.00	18.00	16.00	10.00	13.00	10.00	12.00	16.00	20.00	18.00	16.00	
			Patching (Med. Severity)		m2	2.10	1.10	2.60	2.20	7.80	7.20	7.90	7.70	4.20	3.80	7.90	
			Patching (Hig. Severity)		m2	9.20	0.10	4.40	3.70	0.00	7.00	9.80	7.60	0.50	4.50	6.20	
			Reference Area		m2	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	
			Tech. Parameter	Annex 4	TPsd, cat1 (%)	20.55	0.51	0.42	0.42	0.40	0.45	0.48	0.50	0.49	0.53	0.46	
			Cat. 1 Index (PI_SDcat1)	Annex 4	PI_SDcat1	2.74	0.07	0.06	0.06	0.05	0.06	0.06	0.07	0.07	0.07	0.06	
			% Score	Table 6	-	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		2	Points	Table 6	-	1	2	2	2	2	2	2	2	2	2	2	1.91
2.3	Category 2 surface distress (Potholes)		Pothole (Med. Severity)		m2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Pothole (Hig. Severity)		m2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Susbsidence/bulge		m2	63	0	0	0	0	0	0	0	0	0	0	
			Reference Area		m2	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	7500.00	
			Tech. Parameter	Annex 4	TPsd, cat.2 (%)	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Cat. 2 Index (PI_SDcat2)	Annex 4	PI_SDcat2	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			% Score	Table 6	-	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		5	Points	Table 6	-	0	5	5	5	5	5	5	5	5	5	5	4.55
2.4	Rutting		Max. rut depth	Table 6		11.70	11.90	7.30	8.90	9.40	9.60	6.60	11.70	10.00	8.00	8.80	
			Rut Depth	Annex 4	RD (mm)	8.00	8.00	6.20	6.50	7.10	8.50	6.30	8.60	7.00	6.00	6.50	
			Rut depth Index	Annex 4	PI_R	1.65	1.65	1.29	1.35	1.47	1.74	1.31	1.76	1.45	1.25	1.35	
			% Score	Table 6	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		5	Points	Table 6	-	5	5	5	5	5	5	5	5	5	5	5	5.00
2.5	Cracking		Long. Cracking (Med. Severity)	Annex 4	m	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	
			Long. Cracking (Hig. Severity)	Annex 4	m	0.0	0.0	0.0	0.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0	
			Tran. Cracking (Med. Severity)	Annex 4	m	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	
			Tran. Cracking (Hig. Severity)	Annex 4	m	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	
			Allig. Cracking (Med. Severity)	Annex 4	m2	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	
			Allig. Cracking (Hig. Severity)	Annex 4	m2	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
			Reference Area	-	m2	7500.0	7500.0	7500.0	7500.0	7500.0	7500.0	7500.0	7500.0	7500.0	7500.0	7500.0	
			Cracking Rate (Area)	Annex 4	TPcr, A (%)	0.000	0.000	0.000	0.000	0.174	0.000	0.000	0.000	0.000	0.000	0.000	
			Cracking Rate (Length)	Annex 4	TPcr, L (%)	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	
			Overall cracking rate	Annex 4	TPcr (%)	0.000	0.000	0.000	0.000	0.185	0.000	0.000	0.000	0.000	0.000	0.000	
			Cracking Index	Annex 4	PI_CR	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	
			% Score	Table 6	-	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	
		3	Points	Table 6	-	3	3	3	3	1.5	3	3	3	3	3	3	2.86

3.1	Pavement bearing Capacity		Central deflection (mm)	Annex 4	D0	0.47	0.33	0.45	0.41	0.32	0.23	0.38	0.35	0.11	0.39	0.35	
			Bearing Capacity Index	Annex 4	PI_B	2.33	1.65	2.25	2.05	1.60	1.17	1.92	1.76	0.55	1.96	1.73	
			% Score	Table 6	.	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		12	Points	Table 6	.	12	12	12	12	12	12	12	12	12	12	12	12.00
3.2	Bridges		Bridge Condition Index	Annex 4	BCI	72.20	85.86	26.04	85.24	81.50	83.53	96.72	85.30	97.00	90.78	60.00	
			Bridge Performance Index	Annex 4	PI_BR	1.93	1.11	4.11	1.15	1.38	1.26	0.41	1.15	0.39	0.80	2.59	
			% Score	Table 6	.	100%	100%	0%	100%	100%	100%	100%	100%	100%	100%	50%	
		8	Points	Table 6	.	8	8	0	8	8	8	8	8	8	8	4	6.91
3.3	Culvert		Worst visual condition rating per km	Annex 4	AR	1.00	0.90	3.00	1.00	2.90	0.90	1.00	4.90	1.10	1.00	1.00	
			Culvert Performance Index	ex 4, Tabl	PI_CU	1.00	0.90	3.00	1.00	2.90	0.90	1.00	4.90	1.10	1.00	1.00	
			% Score	Table 6	.	100%	100%	0%	100%	50%	100%	100%	0%	100%	100%	100%	
		5	Points	Table 6	.	5	5	0	5	2.5	5	5	0	5	5	5	3.86
3.4	Side Drains		Worst visual condition rating per km	Annex 4	AR	1.50	1.30	3.30	1.50	2.50	0.60	1.90	3.00	0.30	3.00	2.10	
			Performance Index	Table 7	PI_SD	1.50	1.30	3.30	1.50	2.50	0.60	1.90	3.00	0.30	3.00	2.10	
			% Score	Table 6	.	100%	100%	0%	100%	50%	100%	100%	0%	100%	0%	50%	
		3	Points	Table 6	.	3	3	0	3	1.5	3	3	0	3	0	1.5	1.91
4.1	Mn EHS MP Reporting		EHS Rating	Table 6	.	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	
			EHS MP Reporting Index	Table 6	PI_EHS	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
			% Score	Table 6	.	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	
		3	Points	Table 6	.	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
4.2	PPE and Safe Working		PPE & Safe Working rating	Table 6	.	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	
			PPE and Safe Working Index	Table 6	PI_PPE	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
			% Score	Table 6	.	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	
		2	Points	Table 6	.	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.50
4.3	Labour law and gender		Labour Law & Gender Rating	Table 6	.	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
			Labour Law and Gender Index	Table 6	PI_LLG	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
			% Score	Table 6	.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
		1	Points	Table 6	.	0	0	0	0	0	0	0	0	0	0	0	0.00
4.4	Pollution control		Pollution Control Rating	Table 6	.	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	
			Pollution Control Index	Table 6	PI_PC	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
			% Score	Table 6	.	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	
		2	Points	Table 6	.	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.50
4.5	Erosion Control & Nat Env		Erosion Cont. & Nat. Env. Rating	Table 6	.	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	
			Erosion Control & Nat. Environment Index	Table 6	PI_EC	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
			% Score	Table 6	.	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		1	Points	Table 6	.	1	1	1	1	1	1	1	1	1	1	1	1.00
4.6	Road safety & engagement		Road Safety & Engag. Rating	Table 6	.	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	
			Road Safety & Engagement Index	Table 6	PI_NE	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
			% Score	Table 6	.	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	
		2	Points	Table 6	.	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.50
																Value of Quarterly Service Level Score (SLSq)	89.39

$AP_q = Min(100, Max(0, (SLSq/30)-2)*100).$



ANNEX B: EQUIPMENT REQUIRED FOR THE MONITORING/SUPERVISION CONSULTANT

1. LABORATORY EQUIPMENT – OTHER EQUIPMENT

The Contracting Entity will install a soil and material laboratory. This laboratory shall be shared with the Monitoring/Supervision Consultant for those tests which require sophisticated and specialized equipment. The Monitoring/Supervision Consultant will be responsible for personnel, material and procedure to carry out tests to evaluate compliance with the level of services.

The list of the minimum equipment, supplied and maintained by the Contracting Entity, required for the sole use of the Project Manager is:

- Topographic Equipment including total station, auto level, tapes and accessories. No. 2 (One set for the Consultant and One set for the Contractor)
- CBR equipment.
- Dynamic Cone Penetrometer (DCP)
- Casagrande Set (Atterberg Limits)
- Soil Classification
- Sieves and Granulometry Test Equipment.
- Proctor Equipment
- Sand Replacement Equipment.
- Pycnometer
- Marshall Equipment
- Asphalt Penetration Equipment
- Abram`s slump cone + other concrete testing requirements
- Additionally, the Monitoring/Supervision Consultant shall carry out performance tests on quarries, asphalt plant, asphalt mixture, aggregates, according to the specifications of "Guidelines of Pavement – AASHTO 1993" and following the procedures of ASTM (American Society for Testing and Materials Volume 4 of 2001).

The frequency and quantity of this test will be based on the AASHTO and ASTM recommendations for each road section rehabilitated and/or maintained by the Contracting Entity. All the parameter must fulfill the level of service required in the TOR of the Contracting Entity.

2. ROAD ROUGHNESS AND DURABILITY

New measuring equipment for Road roughness (Riding comfort) and durability (namely – Profilometer and Falling Weight Deflectometer) shall be purchased by the Contracting Entity, and be used by the Monitoring/Supervision Consultant, at the Monitoring/Supervision Consultant request. The Contracting Entity is allowed to use the same equipment for his own Quality Control purposes, as well. The Contracting Entity shall maintain properly this equipment at all times.

Whenever requested by the Monitoring/Supervision Consultant, the Contracting Entity shall operate this measuring equipment, under the supervision and instructions of the Monitoring/Supervision Consultant, at the roads sections indicated by the

Monitoring/Supervision Consultant. The results of these measurements shall be the property of the Monitoring/Supervision Consultant.

FALLING WEIGHT DEFLECTOMETER (FWD): The required Falling Weight Deflectometer (FWD) should be Impulse Load Device in accordance with ASTM D4694. This device loads the pavement by dropping a known mass through a known distance simulating the effect of a passing wheel load and measuring the response of the pavement. No alternative equipments type will be accepted.

Vertical deflections are measured in the outer wheel path at the center of the applied load and at various distances away from the load. The procedure to measure the deflections will meet the requirements of American Society for Testing and Material 2001 (ASTM Standard). The equipment must be calibrated/validated as per the manufacturer's recommendations. This parameter will be measured every six months in order to evaluate the compliance with the required Level of Service.

Methodologies for Durability Measures

The deflection of a road is taken to be an indication of its load carrying capacity. It will be checked at road sections selected by the Project Manager based on non-destructive (NDT) evaluation. Measurement is carried out with a Falling-Weight-Type Impulse Load device (FWD) according to ASTM D 4694. The FWD measures the vertical deflection response to the surface to an impulse load applied to the pavement surface. Vertical deflections are measured in the outer wheel path at the center of the applied load and at various distances away from the load.

At the end of the contract period, the Contracting Entity will transfer the equipment to the Client/IIU-MPW in good working conditions.

11. **ROUGHNESS – IRI:** The Contracting Entity shall measure the roughness using the method of International Roughness Index (IRI). The equipment required must be a Class 1 precision Profile according to the specifications as defined by ASTM E-950. The measure of roughness will be made in a continuous way in the wheel tracks of each lane of the carriageway, meeting the requirements of ASTM. The equipment must be calibrated/validated as per the manufacturer's recommendations. This parameter will be measured every three months to evaluate the level of service reached by the Contractor.

Methodologies for Road User Service and Comfort

The indicator to be used to determine the road roughness will be the International Roughness Index (IRI), whose measure unit is expressed in meters per kilometer (m/km). For measuring the IRI, a Profilometer that meets the Class 1 precision and bias specifications as defined by ASTM E-950 must be used and other associated ASTM standard for computation and calibration such as E-1448, E-1364, E-1082, E-867 among others. The measure of roughness will be made in a continuous way, in the wheel tracks of each lane of the carriageway with a minimum speed of 25 km/h. The equipment must be calibrated/validated as per the manufacturer's recommendations and from observation during previous use and following requirements of ASTM E-1448, E-1082.

At the end of the contract period, the Contracting Entity will transfer the equipment to the Client/IIU-MPW in good working conditions.

The Contracting Entity shall maintain properly the laboratory equipment, FWD and Roughness at all times. Whenever requested by the Monitoring/Supervision Consultant, the Contracting

Entity shall operate this measuring equipment, under the supervision and instructions of the Monitoring/Supervision Consultant, at the roads sections indicated by the Monitoring/Supervision Consultant. The results of these measurements shall be the property of the Monitoring/Supervision Consultant.

ANNEX C: LIST OF BRIDGES

Bridge No.	Chainage	Length (M)	Bridge Type (Description)	No. of spans	Carriageway width	depth to water level	Walkway/ shoulder	Condition	MPW/IIU ASSESSMENT	Work Required
	From Toe Town to Zwedru (km)									
1	70.80	15.5	RC bridge with guardrail	1	7.3	2.2	none	good	Routine Maintenance; Repair guardrails. Add Pedesterian walkways.	Contractor is to proposed the work require based on field assessment
2	76.70	16.0	RC bridge, with guardrails	1	7.3	4.4	none	good	Routine Maintenance; Repair guardrail Add Pedesterian walkways.	Contractor is to proposed the work require based on field assessment
3	85.6	19.2	RC bridge with guardrail	1	7.3	4.5	none	good	Routine Maintenance; Repair guardrails. Add Pedesterian walkways.	Contractor is to proposed the work require based on field assessment
4	85.7	38.6	RC bridge with guardrail	2	7.3	5.8	none	good	Routine Maintenance; Replace missing sections of guardrails. Add Pedesterian walkways.	Contractor is to proposed the work require based on field assessment
5	109.9	31.0	RC bridge with guardrail	2	7.4	5.8	none	good	Routine Maintenance. Add Pedesterian walkways.	Contractor is to proposed the work require based on field assessment

Note: Contractor is to provide actual work required after field Assessment. The contractor is to assess the section from Toe Town to Cote D'Ivoire border for any bridge type and provide the work requirements.

APPENDIX A: FRAUD AND CORRUPTION

(Text in this Appendix shall not be modified)

1. Purpose

The Bank's **Anti-Corruption Guidelines** and this annex apply with respect to procurement under Bank Investment Project Financing operations.

2. Requirements

2.1 The Bank requires that Borrowers (including beneficiaries of Bank financing); bidders (applicants/proposers), consultants, contractors and suppliers; any sub-contractors, sub-consultants, service providers or suppliers; any agents (whether declared or not); and any of their personnel, observe the highest standard of ethics during the procurement process, selection and contract execution of Bank-financed contracts, and refrain from Fraud and Corruption.

2.2 To this end, the Bank:

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) "**corrupt practice**" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

(i) "**fraudulent practice**" is any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation;

(iii) "**collusive practice**" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

(iv) "**coercive practice**" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

(v) "**obstructive practice**" is:

(a) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or

(b) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under paragraph 2.2 e. below;

(b) rejects a proposal for award if the Bank determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/ or their employees, has, directly

or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;

(c) in addition to the legal remedies set out in the relevant Legal Agreement, may take other appropriate actions, including declaring mis-procurement, if the Bank determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement process, selection and/or execution of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;

(d) pursuant to the *Bank's Anti-Corruption Guidelines*, and in accordance with the Bank's prevailing sanctions policies and procedures, may sanction a firm or individual, either indefinitely or for a stated period of time, including by publicly declaring such firm or individual ineligible (i) to be awarded or otherwise benefit from a Bank-financed contract, financially or in any other manner;[1] (ii) to be a nominated[2] sub-contractor, consultant, manufacturer or supplier, or service provider of an otherwise eligible firm being awarded a Bank-financed contract; and (iii) to receive the proceeds of any loan made by the Bank or otherwise to participate further in the preparation or implementation of any Bank-financed project;

(e) requires that a clause be included in bidding/request for proposals documents and in contracts financed by a Bank loan, requiring (i) bidders (applicants/proposers), consultants, contractors, and suppliers, and their sub-contractors, sub-consultants, service providers, suppliers, agents personnel, permit the Bank to inspect[3] all accounts, records and other documents relating to the procurement process, selection and/or contract execution, and to have them audited by auditors appointed by the Bank.

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[1] *For the avoidance of doubt, a sanctioned party's ineligibility to be awarded a contract shall include, without limitation, (i) applying for pre-qualification, expressing interest in a consultancy, and bidding, either directly or as a nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider, in respect of such contract, and (ii) entering into an addendum or amendment introducing a material modification to any existing contract.*

[2] *A nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider (different names are used depending on the particular bidding document) is one which has been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that allow the bidder to meet the qualification requirements for the particular bid; or (ii) appointed by the Client/IIU-MPW.*

[3] *Inspections in this context usually are investigative (i.e., forensic) in nature. They involve fact-finding activities undertaken by the Bank or persons appointed by the Bank to address specific matters related to investigations/audits, such as evaluating the veracity of an allegation of possible Fraud and Corruption, through the appropriate mechanisms. Such activity includes but is not limited to: accessing and examining a firm's or individual's financial records and information, and making copies thereof as relevant; accessing and examining any other documents, data and information (whether in hard copy or electronic format) deemed relevant for the investigation/audit, and making copies thereof as relevant; interviewing staff and other relevant individuals; performing physical inspections and site visits; and obtaining third party verification of information.*

APPENDIX B: CODE OF CONDUCT

CODE OF CONDUCT FOR MONITORING/SUPERVISION CONSULTANT'S STAFF

We are the Monitoring/Supervision Consultant, [*enter name of* Monitoring/Supervision Consultant]. We have signed a contract with [*enter name of Employer*] for [*enter description of the Services*]. These Services will be carried out at [*enter the Site and other locations where the services will be carried out*]. Our contract requires us to implement measures to address environmental and social risks related to the Works, including the risks of sexual exploitation and assault and gender-based violence.

This Code of Conduct is part of our measures to deal with environmental and social risks related to the Works. It applies to all our staff and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the services. All such persons are referred to as "**Monitoring/Supervision Consultant's Personnel"** and are subject to this Code of Conduct.

This Code of Conduct identifies the behavior that we require from all Monitoring/Supervision Consultant's Staff.

Our workplace is an environment where unsafe, offensive, abusive or violent behavior will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation.

REQUIRED CONDUCT

Monitoring/Supervision Consultant's Personnel shall:

1. carry out his/her duties competently and diligently;
2. comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Monitoring/Supervision Consultant's Staff and any other person;
3. maintain a safe working environment including by:
    a. ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;
    b. wearing required personal protective equipment;
    c. using appropriate measures relating to chemical, physical and biological substances and agents; and
    d. following applicable emergency operating procedures.
4. report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health;
5. treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;
6. not engage in any form of sexual harassment including unwelcome sexual advances, requests for sexual favors, and other unwanted verbal or physical conduct of a sexual nature with other Monitoring/Supervision Consultant's, Contractor's or Client/IIU-MPW's Personnel;
7. not engage in Sexual Exploitation, which means any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another. In

Bank financed projects, sexual exploitation occurs when access to or benefit from Bank financed Goods, Works, Consulting or Non-consulting services is used to extract sexual gain;

8. not engage in Sexual Assault, which means sexual activity with another person who does not consent. It is a violation of bodily integrity and sexual autonomy and is broader than narrower conceptions of "rape", especially because (a) it may be committed by other means than force or violence, and (b) it does not necessarily entail penetration.
9. not engage in any form of sexual activity with individuals under the age of 18, except in case of pre-existing marriage;
10. complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, and Sexual Exploitation and Assault (SEA);
11. report violations of this Code of Conduct; and
12. not retaliate against any person who reports violations of this Code of Conduct, whether to us or the Employer, or who makes use of the [Project Grievance [Redress] Mechanism].

RAISING CONCERNS

If any person observes behavior that he/she believes may represent a violation of this Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done in either of the following ways:

1. Contact [*enter name of the Monitoring/Supervision Consultant's Social Expert with relevant experience in handling gender-based violence, or if such person is not required under the Contract, another individual designated by the Monitoring/Supervision Consultant to handle these matters*] in writing at this address [ ] or by telephone at [ ] or in person at [ ]; or
2. Call [ ] to reach the *Monitoring/Supervision Consultant*'s hotline *(if any)* and leave a message.

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. We take seriously all reports of possible misconduct and will investigate and take appropriate action. We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

There will be no retaliation against any person who raises a concern in good faith about any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

There will be no retaliation against any person who raises a concern in good faith about any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

CONSEQUENCES OF VIOLATING THE CODE OF CONDUCT

Any violation of this Code of Conduct by *Monitoring/Supervision Consultant*'s Staff may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR *MONITORING/SUPERVISION CONSULTANT STAFF*:

I have received a copy of this Code of Conduct written in a language that I comprehend. I understand that if I have any questions about this Code of Conduct, I can contact [*enter name of Monitoring/Supervision Consultant's contact person with relevant experience in handling gender-based violence*] requesting an explanation.

Name of *Monitoring/Supervision Consultant*'s Staff: [insert name]

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the *Monitoring/Supervision Consultant*:

Signature: _____

Date: (day month year): _____

A copy of the code shall be displayed in a location easily accessible to the community and project affected people. It shall be provided in languages comprehensible to the local community, Contractor's personnel (including sub-contractors and day workers), Contracting Entity's and Project Manager's Personnel, and affected persons.

APPENDIX C - LEGAL ENVIRONMENTAL AND SOCIAL SPECIFICATIONS

This part would provide a set of rules to be followed by the contractor in order to avoid unnecessary damage to the environment and/or social aspects on housing, sanitation, and health of labor.

The Environmental and Social components should follow the following documents:

- Resettlement Policy Framework (RPF) of the Government of Liberia.
- Environmental Management Plan (EMP) associated with the implementation of the emergency works for Tappita to Toe Town Road Corridor of Government of Liberia.
- Resettlement Action Plan (RAP) that will be prepared by the contractor in accordance with the RPF and reviewed and approved by the IIU and the World Bank before the commencement of works.
- Environmental, Health and Safety (EHS) Plan that will be prepared by the contractor to show in detail how the provisions of the EMP will be implemented for the Project.

The Bidder should consider the existing laws on Civil Works Contracts currently available in Liberia, including the following but not limited to:

- Constitution of Republic of Liberia 1986.
- National Environmental Policy (2003);
- Environmental Protection and Management Law of the Republic of Liberia and Annexes of November 26, 2002;
- Land Act (1856);
- County Act (1969); and
- Land Acquisition Act (1929).

As well as Public and Private Sector with possible relevancy to the road project including the following but not limited to:

- Environmental Protection Agency (EPA);
- Ministry of Public Works;
- Ministry of Lands Mines & Energy
- Liberia Repatriation Resettlement and Reintegration Commission (LRRRC);
- Ministry of Internal Affairs/Ministry of Interior;
- Ministry of Health and Social Welfare
- Ministry of Planning and Economics Affairs

D.1. LOCAL GOVERNMENT POLICY AND FRAMEWORK

- ✓ ***Right of Way***

The Constitution of the Republic of Liberia (1986) provides in Chapter 3, Article 11 the right to acquire, possess and protect property. It is this fundamental right that many Liberians relied on to

acquire properties (including land). There are laws and procedures governing the acquisition of land. Private lands can be acquired by purchase from the legitimate owners, by a process involving the preparation, probation and registration of transfer deeds. Alternatively, private land can be leased for a specified length of time, after which, the properties revert to the owner.

When the Government finds it necessary to use private properties for public good, the right of eminent domain is invoked, and the properties' owners are compensated as is presented in Civil Procedure Law: Section 16.71: Provision of Funds for Condemnation

"whenever the Legislature of Liberia by statute or joint resolution authorizes work of a public or quasi-public nature be done wholly or partly at public expense and directs the condemnation of private property therefore if necessary, it shall in the same statute or resolution provide that there be included in the annual budget a sum for the compensation of the owners of real property which is to be wholly or partly condemned in such undertaking"

In the event that owners will not consent to sell properties to the Government at the price offered by the Government, the Civil Procedure Law provides in Chapter 16, subchapter E, section 16.72 (when condemnation proceedings are necessary), condemnation proceedings to be instituted and prosecuted as follows:.

"when land is required for public use and the owner or owners or some of them will not consent to sell it to the Government at the price offered by the government, condemnation proceedings shall be instituted ……."

For purposes of registration of land as public land, the property law section 8.123 establishes: "the registration of land as public, subject to any registered encumbrances, which shall include without limitation, interests in and rights over such land granted in concession and other agreements made under authority of law, and by way of delineation of Tribal Reserve Areas and communal holdings, shall enable such land to be disposed of in accordance with the provisions relating thereto contained in the Public Lands Law……."

And according to the sale of Public Land, the Public Lands Law in chapter three (3), section 30 presents the procedure to be followed:

i. A citizen desiring to purchase public land located in the Hinterland shall first obtain consent of the Tribal Authority to have the parcel of land deeded to him……..
ii. A citizen desiring to purchase public land in the County Area shall apply to the Land Commissioner of the county in which the land is located, and the Land Commissioner if satisfied that the land in question is not privately owned and is unencumbered shall issue a certificate to that effect.
iii. After survey of the property and deed prepared, the President shall sign same for subsequent probation and registration.

- ✓ ***AXLE LOAD CONTROL AND ROAD CONTROL***

The Liberian Code of laws revised in 1972 and 1979, in Chapter 7, 8 and 9 is referred to axel load, inspection of motor vehicles and accidents controlled by the Ministry of Justice in the

power of the Attorney General and the traffic Department and enforced by the Liberian National Police.

The highways and bridges are normally built with certain specifications and therefore have maximum weight they can sustain.

The Minister therefore, in his control of the highways has made regulations stating conditions relating to weights of vehicles on the highways provides that no vehicle shall be used on a Highway if any one axle exceeds 18000 pounds where axle load is defined as the total load transmitted to the road by all wheels whose centers are included between two parallel transverse planes 40 inches apart extending across the full width of the vehicle.

In addition, subject to the limitations mentioned above, the total gross weight load imposed upon a highway on one group of two or more consecutive axles of a vehicle or combination of vehicles shall not exceed the gross weight given for the respective distance between the first and last axle of the total group of axles measured longitudinally to the nearest foot varying from 32,000 pounds to 73,280 pounds as is specified in section 7.10 of the vehicle and traffic law.

The Attorney General can authorize the operation, drive or movement upon specified public highways a vehicle or combination of vehicles of a size or weight or load exceeding the maxima specified before, and may limit the number of trips or establish seasonal or other limitations to be operated.

Enforcement of provisions regarding weight of vehicles

Any police officer who has reason to believe that the weight of a vehicle and load is unlawful is authorized to require the operator of the vehicle to stop and have the vehicle and load weighed on a portable or stationary scales. The law also presents the lightening load on overweight vehicle, penalty, and liability for damage due to excess weight.

Axle load control is essential to protect the life of the highway and currently there are no portable or stationary scales to control the weight here in Liberia due to the civil war that just ended a few years ago.

The Ministry of Public Works should interact with the Ministry of Justice, Ministry of Transportation and the Liberian National Police in order to install a method of axle load control on those roads as well as the enforcement of the law. The contractor may be authorized to install and operate the required weighbridges on behalf of the Minister of Public Works – Ministry of Justice to adequate compliance with the weight restrictions.

The accessibility and connectivity of roads are controlled by the Attorney General and enforced by the Liberian National Police. However, the Attorney General may establish permanent or temporary stations to inspect the highways and vehicles and is authorized to license official stations operated by private persons. Such a license shall be issued only after appropriate inquiry and investigation and only when the Attorney General is satisfied and that the applicant complies with the rules and regulations promulgated.

D.2. ENVIRONMENTAL AND RESETTLEMENT ISSUES

A Resettlement Policy Framework (RPF) and the Environmental Management Plan (EMP) associated with the Tappita to Toe Town Road Project have been prepared by the Government of Liberia with the objective of presenting the principles and procedures for environmental assessment and resettlement/compensation, respectively as it relates to the roads sub-sector.

The main outlines and findings related to environmental and social issues are presented next.

D.2.1. DESCRIPTION OF THE WORLD BANK ENVIRONMENT AND SOCIAL SAFEGUARD POLICIES

The Environmental Management Plan (EMP) is based on the laws of Liberia and the applicable Environment and Social Safeguard Policies of the World Bank.

The World Bank Safeguard Policies applicable to the Project are;

1. Environment Assessment (OP4.01, BP 4.01, GP 4.01)
2. Involuntary Resettlement (OP 4.01, BP 4.12)

A complete description of the Bank safeguards and their triggers for applicability can be found on the World Bank's official web site www.worldbank.org. The two triggered policies of Environment assessment and involuntary resettlement are discussed further below:

Environment Assessment (OP4.01, BP 4.01, GP 4.01)

This policy requires Environment assessment (EA) of projects/investments proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus improve decision making. The EA is a process whose depth and type of analysis depend on the nature, scale, and potential Environment impact of the activities proposed. The EA process takes into account the natural environment (air, water, and land): human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property) and trans boundary and global Environment aspects.

The Environment and social impacts of the project will come from the activities of rehabilitation of road infrastructure. Therefore, the Contractor should (a) update the Environmental Management Plan (EMP) each time that the work program is updated, and (b) present the mitigation, monitoring and institutional measures to be taken during implementation and operation of the project to eliminate adverse Environment and social impacts, offset them, or reduce them to acceptable levels.

Involuntary Resettlement (OP 4.12, BP 4.12)

Significant efforts are to be made in the design of road works to avoid impacts on people, land, property, including person's access to natural and other economic resources, as far as possible. Notwithstanding, land acquisition, compensation and resettlement of people seem inevitable on certain occasions. These social issues are of crucial concern to the Employer and the Bank as the impact on poverty, if left unmitigated, is negative, immediate and widespread. Thus, OP 4.12 will be triggered in those cases. Therefore, the Contractor should ensure that the implementation of the RAP (number of persons affected, number of persons paid compensation) is reported in the monthly progress reports.

The World Bank Safeguard policy OP/BP 4.12, in most cases, is not triggered because people are being affected by physical displacement. It is triggered because the project activity causes land acquisition, whereby a physical piece of land is needed and people may be affected because they are cultivating on that land, they may have buildings on the land, they may be using the land for water and grazing of animals or for business, or they may otherwise access the land economically, spiritually or any other way which may not be possible during and after the project is implemented. Therefore, people are in most cases compensated for their loss (of land, property or access) either in kind or in cash of which the former is preferred.

The resettlement policy applies to all affected and displaced persons regardless of the total number affected, severity of impact and whether or not they have legal title to land.

D.2.2 ENVIRONMENTAL MANAGEMENT PLAN

This section describes the measures necessary to mitigate the impacts identified above. The EMP for the implementation of the works for Tappita to Toe Town (40km) Road must be followed by the Contractor. The EMP will be presented to the Contractor as a separate document. It is important to note that, insofar as possible, the EMP is based on avoidance of environmental impacts, rather than amelioration of their adverse consequences. Avoidance of impacts is always the preferred form of mitigation. The contractor will develop a project-specific EHS Plan to detail how the provisions of the EMP will be implemented during the execution of the Project.

PHYSICAL ENVIRONMENT		
Issue	**Mitigation**	**Responsibility**

Soils and Geology – Quarry Operations. Crushed Rock will be required	The use of quarries are limited to only licensed quarries	Please see next section. Enforcement by IIU/MPW and its Monitoring Consultant
Soil and Geology – Loss of Soil for Agricultural production	No loss of soil for agricultural use is anticipated	N/A
Soils and Geology Erosion	• Use of less erosion-prone materials • Timely completion of final forming & re-vegetation. • Trenching where necessary. • Seeding with fast growing native seed mixtures. • Use of grass sods where warranted. • Stabilization of embankment slopes. • Use of riprap to reduce erosion when required. • Side slopes based on soil and other conditions per Project Specifications. • Stepped embankments if greater than six meters. • Construction in erosion-and flood-prone areas restricted to the dry season	Please see next section. Enforcement by IIU/MPW and its Monitoring Consultant
Soils – Borrow pits	The use of borrow pits are limited to only existing authorized borrow pits.	
Hydrology – Alteration of surface drainage	• Adoption of appropriate hydrological standards. • Installation of adequately sized drainage channels. • Stabilization of downstream slopes with concrete, rock gabions or walls to avoid erosion where warranted. • Contract provisions to ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities.	Please see next section. Enforcement by MPW and its Monitoring Consultant
Hydrology – Water Quality Degradation.	Mitigation includes: • Avoidance of adverse impacts through enforcement of good environmental management practice under Monitoring Consultant staff. • Design engineering to ensure that road drainage provisions and rehabilitated embankments that do not alter the current status of natural water bodies and irrigation structures adjacent to alignments. • Contract provisions to ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities.	Please see next section. Enforcement by MPW and its Monitoring Consultant
Hydrology – Impacts to Wetlands	No significant impacts to wetlands are anticipated	N/A
Hydrology – Impacts to Subsurface Hydrology	Safeguards are part of the contract to control runoff and proper waste disposal	Please see next section. Enforcement by MPW and its Monitoring Consultant
Hydrology – flood and Inundation Characteristics	These works are likely to decrease flood and inundation issues in the project. As such no mitigation actions are warranted	N/A

Hydrology – Impacts to irrigation system	The Contractor will ensure the irrigation channels diverted during the construction phase will be returned to their original status. Where this is not possible, or where channels are irrevocably altered, consultation will be held with landowners to ensure that an adequate redesign is undertaken to ensure that irrigation channels are returned as closely as possible to their former layout. The Contractor will undertake the necessary works to achieve this status including provision of labor.	Please see next section. Enforcement by MPW and its Monitoring Consultant
Air Quality – Construction related pollution	Mitigation includes: • Location of asphalt and hot-mix plants • Emission control requirements • Requirements to spray for dust control • Use of tarps when transporting. • Authorization of Supervising Engineer to discontinue construction under unfavorable conditions. • Use of pollution control devices checked at regular intervals. • Prohibition of open burning.	Please see next section. Enforcement by MPW and its Monitoring Consultant
Air Quality – Operational Pollution.	No significant operational air quality impacts anticipated. No mitigation required	N/A
BIOLOGICAL ENVIRONMENT		
Issue	**Mitigation**	**Responsibility**
Impacts to Flora	Some small scale localized impacts may occur to roadside vegetation during construction of culverts and cleaning of ditches. Such impacts are unlikely to have significant affects to the local environment.	N/A
Impacts to Fauna	No impacts to fauna are anticipated due to the small scale nature of the emergency works. no mitigation required.	N/A
Impacts to protected Areas	None of the project roads are located within 100 kmof any protected areas. No mitigation required	N/A
SOCIO – ENVIRONMENTAL		
Issue	**Mitigation**	**Responsibility**
Impact to Economic and demographic characteristics	The potential impacts on the area economy of the project are assessed as beneficial and do not warrant mitigation	N/A
Impacts to Existing land use	Mitigation includes: Maintain and cleanup campsites, and respect the rights of local landowners. If located outside the ROW, written agreements with local landowners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within a predetermined time period.	Please see next section. Enforcement by MPW and its Monitoring Consultant
Resettlement and Compensation Issues – Displacement and other	There will be no requirement for resettlement or compensation as works will be limited to the existing road with no widening or changes of alignment	N/A

PAP impacts..	required. There is some form of encroachment into the right of way along some road sections, particularly those within urban areas. However, the encroachment is almost exclusively by small portable market stalls selling their wares to passers by. Activities such as pavement repair, culvert repair and ditch cleaning may require the short term relocation of these practices from the right of way, but such disturbances will not trigger the need for resettlement action plans or compensation payments.	
Impacts to Ethnic/ Indigenous people	Most of the Liberian population (95%) belongs to 16 indigenous African tribes -the most common of which are Bassa and Kpelle. No significant negative impacts to ethnic / indigenous people have been identified and as such no mitigation actions warranted.	N/A
Impacts Infrastructure – Transport	Traffic detours during construction will be mitigated by the provision of notice and the adequate use of signs and signalmen. Contracts will include the provision for a traffic manager for the road	Please see next section. Enforcement by MPW and its Monitoring Consultant
Impact to Cultural resources	No significant cultural resources were identified during site visits. It is assumed that any possible cultural resources have been looted or destroyed. In the event of unanticipated discoveries of cultural or historic artifacts (movable or immovable) in the course of the work, the Contractor shall take all necessary measures to protect the findings and shall notify the Supervising Engineer.	Please see next section. Enforcement by MPW and its Monitoring Consultant
Public Health and Safety Impacts - Construction Accidents	Contract-specified requirements will require introductory safety orientation programs, including STD awareness programs, and the identification of emergency facilities. Contractors will be required to provide basic emergency health facilities for workers.	Please see next section. Enforcement by MPW and its Monitoring Consultant
Noise Impacts – Construction Phase	Mitigation includes: • Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken. • Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible. • Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the site engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas.	Please see next section. Enforcement by MPW and its Monitoring Consultant
Waste Disposal and Hazardous Materials – Air water and safety	Mitigation includes: • Insofar as possible, all temporary construction Materials -Air facilities shall be located at least 50	Please see next section. Enforcement by MPW and

impacts.	meters away from water and a water course, stream, or canal. • The Contractor is required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works. • The Contractor shall not dispose of used pavement material on the road or highway side, nor in water courses or wetlands. Such material shall be utilized or disposed of in places approved by the Engineer. • Whenever large amounts of asphaltic concrete are to be removed from a highway, the material should be reused or disposed of by burial to a minimum of one meter depth. • The Contractor shall not dispose of any surplus material on private land unless authorized by in writing by the owner(s), authenticated before a Notary Public, and with previous authorization of the Engineer	its Monitoring Consultant

D.3.3. ENVIRONMENTAL MONITORING

Monitoring is important to ensure that environmental impacts are prevented and mitigated by the EMP, to ensure that sound engineering practices are followed and to encourage on-the-job behavior conducive to environmental protection. Observational monitoring activities are recommended as part of the Project's Environmental Management Program. Observational monitoring refers to routine site investigations and reporting procedures by the Project's Monitoring Consultant (MC). Environmental Monitoring will be undertaken during both the construction and operation phases to ensure the effectiveness of mitigation measures, to determine the accuracy of impact prediction, and to respond to unanticipated environmental concerns at an early stage in order to adopt appropriate remedial measures. This comprehensive monitoring exercise will be carried out by the EPA and the IIU/MPW.

Monitoring of direct impacts will be carried out by the MC and will include, but not restricted to, the following concerns:

- Erosion along highway segments and borrow sites during and after construction;
- Silting and increased sediment loads to streams crossed by the highway.
- Prevention of damage to undiscovered significant archeological or historical findings;
- Verification that proper waste disposal at construction sites and road camps is done;
- Assurance that construction sites and road camps are cleaned after construction; and
- Inspections of vegetation cover (removal and re-growth) on the basis of field examinations.

D.3.4. PROVISIONS

1. General Provisions and Precautions

The Contractor shall take all necessary measures and precautions and otherwise ensure that the execution of the Works and all associated operations on the Work Sites or off-site are carried out in conformity with statutory and regulatory environmental requirements of Liberia. The Contractor shall take all measures and precautions to avoid any nuisance or disturbance arising from the execution of the Work. This shall, wherever possible, be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated. In the event of any spoil or debris or silt from the Work Sites being deposited on any adjacent land, the Contractor shall immediately remove all such spoil debris or silt and restore the affected area to its original state to the satisfaction of the responsible authorities. The Contractor can subcontract some works of the project.

2.Water Quality

The following conditions shall apply to avoid adverse impacts to water quality:

- The Sub-Contractor/Contractor shall prevent any interference with the supply to, or abstraction from, water resources and the pollution of water resources (including underground percolating water) as a result of the execution of the Works.
- The Sub-Contractor/Contractor shall not discharge or deposit any matter arising from the execution of the Work into any waters except with the permission of the Contractor and regulatory authorities concerned.
- The Sub-Contractor/Contractor shall at all times ensure that all existing stream courses and drains within and adjacent to the Site are kept safe and free from any debris and any materials arising from the Works.
- The Sub-Contractor/Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes and the like from pollution, silting, flooding or erosion as a result of the execution of the Works.

3.Air Quality

The following conditions shall apply to avoid adverse impacts to air quality:

- Open burning will be prohibited.
- Blasting (if any) will be carried out using small charges, and dust-generating items will be conveyed under cover.
- In periods of high wind, dust-generating operations shall not be permitted within 200 meters of residential areas having regard to the prevailing direction of the wind.
- Asphalt and hot-mix plants sites shall not be established prior to the approval of the Contractor and shall be located at least 500 meters away from the nearest sensitive receptor (e.g., schools and hospitals). Operators will be required to install emission controls.
- Water sprays shall be used during the delivery and handling of materials when dust is likely to be created and to dampen stored materials during dry and windy weather.
- Stockpiles of materials shall be sited in sheltered areas or within hoarding, away from sensitive areas. Stockpiles of friable material shall be covered with clean tarpaulins, with application of sprayed water during dry and windy weather. Stockpiles of material or debris shall be dampened prior to their movement whenever warranted.
- Vehicle with an open load-carrying area used for transporting potentially dust-producing material shall have properly fitting side and tailboards. Materials having the potential to produce dust shall not be loaded to a level higher than the side and tail boards and shall be covered with a clean tarpaulin in good condition. The tarpaulin shall be properly secured and extend over the edges of the side and tailboards.

- In periods of adverse weather adverse impacts to adjacent residents or site employees during construction will be mitigated by either discontinuing until favorable conditions are restored, or, if warranted, sites may be watered to prevent dust generation, particularly at crushing plants.
- Machinery and equipment will be fitted with pollution control devices, which will be checked at regular intervals to ensure that they are in working order. Best available pollution control technologies will be required.

4. Protection of Soils

Borrow Pits. The following conditions shall apply to borrow pits:

- Borrow areas will be located outside the ROWs.
- Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.
- The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Contractor is required before final acceptance and payment under the terms of contracts.
- Borrow pit areas will be graded to ensure drainage and visual uniformity, or to create permanent tanks/dams.
- Topsoil from borrow pit areas will be saved and reused in re-vegetating the pits to the satisfaction of the Contractor.
- Additional borrow pits will not be opened without the restoration of those areas no longer in use.

Quarries. To ensure adequate mitigation of potential adverse impacts, only licensed quarrying operations are to be used for material sources. If licensed quarries are not available the Sub-Contractors may be made responsible for setting up their dedicated crusher plants at approved quarry sites

Erosion. To avoid potential adverse impacts due to erosion, the Sub-Contractor/Contractor shall:

- Line spillage ways with riprap to prevent undercutting.
- Provide Mitigation plantings and fencing where necessary to stabilize the soil and reduce erosion.
- Upgrade and adequately size, line and contour storm drainage to minimize erosion potential.
- To avoid erosion and gullying of road formations, the Contractor should reduce his earthworks during the peak of rainy seasons, use gabions and miter drains, and avoid angle termination at the intersections of cuts and fills.
- As noted in elsewhere in these Specifications, ditches shall be designed for the toe of slopes in cut sections with gutters or drainage chutes being employed to carry water down slopes to prevent erosion. Interceptor ditches shall be designed and constructed near the top of the back of slopes or on benches in the cut slopes as well as when there is a slope on adjacent ground toward the fill. When the roadway has a steep longitudinal slope, a drain is to be designed and constructed at the down-slope end of the cut to intercept longitudinal flow and carry it safely away from the fill slopes.

5. Avoidance of Social Impacts

To avoid adverse social impacts, the Sub-Contractor shall:

- Coordinate all construction activities with neighboring land uses and respect the rights of local landowners. If located outside the ROW, written agreements with local landowners for

temporary use of the property will be required and sites must be restored to a level acceptable to the owner within a predetermined time period.

- Maintain and cleanup campsites.
- Attend to the health and safety of their workers by providing basic emergency health facilities for workers and incorporate programs aimed at the prevention of sexually transmitted diseases as a part of all construction employee orientation programs.
- Obtain approval of all diversions and accommodations of traffic. A stipulated by Section which states that "the Sub-Contractor shall provide the Contractor with a written traffic control plan which is to include when and where flagmen shall be employed and when and where traffic cones or other devices such as barricades and/or lights will be used. Where ... traffic diversions area planned for ... additional areas (will) be de-mined and the diversions clearly defined for travel."
- Construct and maintain by-passes around bridges to be reconstructed until such time as the bridge is open for traffic. By-passes will be removed and the affected areas re-graded so as to blend in with the existing contours when the bridge is opened.

6. Noise

To avoid adverse impacts due to noise, the Sub-Contractor/Contractor shall:

- Consider noise as an environmental constraint in his planning and execution of the Works.
- Use equipment conforming to international standards and directives on noise and vibration emissions.
- Take all necessary measures to ensure that the operation of all mechanical equipment and construction processes on and off the Site shall not cause any unnecessary or excessive noise, taking into account applicable environmental requirements.
- Maintain exhaust systems in good working order; properly design engine enclosures, use
- intake silencers where appropriate and regularly regular maintain noise-generating equipment.
- Use all necessary measures and shall maintain all plant and silencing equipment in good condition so as to minimize the noise emission during construction works.
- Schedule operations to coincide with periods when people would least likely be affected and limit work hours and work days to less noise-sensitive times. Hours-of-work will be approved by the Contractor having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Sub-Contractor's hours of working shall be limited to 8 AM to 6 PM.
- Incorporate noise considerations in public notification of construction operations and specify methods to handle complaints. Disposal sites and haul routes will be coordinated with local officials to avoid adverse traffic noise.

7. Protection of Historic and Cultural Resources

To avoid potential adverse impacts to historic and cultural resources, the Sub-Contractor/Contractor shall; in the event of unanticipated discoveries of cultural or historic artifacts (movable or immovable) in the course of the work, the Sub-Contractor/Contractor shall take all necessary measures to protect the findings and shall notify the Contractor and provincial-level representatives of the Archaeological Committee under the Ministry of Information and Culture. If continuation of the work would endanger the finding, project work shall be suspended until a solution for preservation of the artifacts is agreed upon.

8. Protection of Utilities

To avoid potential adverse impacts to utilities, the Sub-Contractor/Contractor shall:

- Ascertain and take into account in his method of working the presence of utility services on and in the vicinity of the Site.
- Take into account in his program the periods required to locate, access, protect, support and divert such services, including any periods of notice required to effect such work in consultation with authorities operating such services.
- Assume all responsibility to locate or to confirm the details and location of all utility services on or in the vicinity of the Site.
- Exercise the greatest care at all times to avoid damage to or interference with services.
- Assume responsibility for any damage and/or interference caused by him or his agents, directly or indirectly, arising from actions taken or a failure to take action, and for full restoration of the damage.

9 Waste Disposal and Hazardous Materials

Water and waste products shall be collected, removed via suitable and properly designed temporary drainage systems and disposed of at a location and in a manner that will cause neither pollution nor nuisance. Insofar as possible, all temporary construction facilities will be located at least 50 meters away from a water course, stream, or canal.

The Contractor shall not dispose of used pavement material on the road or highway side, nor in water courses or wetlands. Such material shall be utilized or disposed of in places approved by the MC.

Whenever large amounts of asphaltic concrete are to be removed from a highway, the material should be reused or disposed of by burial to a minimum of one meter depth.

The Contractor shall not dispose of any surplus material on private land unless authorized by in writing by the owner(s), authenticated before a Notary Public, and with previous authorization of the MC.

10. Environmental Monitoring

Monitoring or direct impacts will be carried out by the Monitoring Consultant and will include, but not restricted to, the following concerns:

- Erosion along highway segments and borrow sites during and after construction;
- Silting and increased sediment loads to streams crossed by the highway.
- Prevention of damage to undiscovered significant archeological or historical findings;
- Verification that proper waste disposal at construction sites and road camps is done;
- Assurance that construction sites and road camps are cleaned after construction; and
- Inspection of vegetation covers (removal and re-growth) on the basis of field examinations.

D.4. RESETLLEMENT FRAMEWORK

The Resettlement Policy Framework (RPF) for the proposed rehabilitation works for the Saglepie to Tappita Corridor Road Project
defines roles, responsibilities, procedures and compensation rates to guide the contractor and its consultants in the preparation of the individual Resettlement Action Plan (RAP).

OBJECTIVES OF THE RPF

- The objectives of the RPF is to provide guidelines for implementing contractor on how to recognize needs for resettlement planning and how to conduct it and implement the results in accordance with World Bank OP 4.12.
- The RPF will define roles, responsibilities, procedures and compensation rates to guide the preparation of the Resettlement Action Plan (RAP).

The World Bank policy and requirements as stated in OP/BP 4.12 provides the guidelines to be followed. The World Bank OP/BP 4.12 details issues of involuntary resettlement, emphasizing the severe economic and environmental risks involved if unmitigated. The World Bank policy objectives urge that involuntary resettlement be avoided whenever possible. If unavoidable, the displaced persons need to:

(i) Share in project benefits;
(ii) Participate in planning and implementation of resettlement programs; and
(iii) Be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to level prevailing prior to the beginning project implementation, whichever is higher.

The World Bank policy covers direct economic and social impacts that both result from Bank – assisted investment projects. This cover taking of land which may result in relocation or loss of shelter, assets, access to assets or loss of income resources or means of livelihood whether or not the affected persons must move to other locations.

The Resettlement Policy Framework (RPF) that will be furnished to the contractor as a separate document covers the following elements:

(i) Project Description;
(ii) Policy Trigger;
(iii) Liberia's Legal Framework and Land Laws;
(iv) Mitigation Instruments;
(v) Procedures for Identification of Impacted Persons;
(vi) Methods for the Resolution of potential conflicts or grievances;
(vii) Responsibilities for the Implementation of mitigation measures;
(viii) Monitoring Arrangements; and
(ix) Conclusions and Recommendations.

RESETTLEMENT PRINCIPLES ACCORDING TO WORLD BANK OP/BP 4.12 AND LIBERIAN LAND ACQUISITION POLICIES

(a) The World Bank Requirements:

The World Bank requirements are details in OP/BP 4.12 The directives outline the following principles:

- Involuntary resettlement should be avoided where feasible or minimized by exploring alternative project designs. If not feasible to avoid resettlement, resources are to be provided to enable the displaced persons to share in the project benefits;
- The population to be affected by the project are those who may lose as the consequence of the project, all or part of their physical and non-physical assets including homes, farms, productive land, properties, income earning opportunities, social and cultural relations and other losses that maybe identified in the process of resettlement;
- All population impacted by the project should be consulted and given the opportunity to participate in planning and implementing resettlement programs;
- All population affected by the project are entitled to be compensated for their lost assets and incomes at full replacement cost and assisted in their efforts to improve their livelihoods and standards of living to pre-project standards;

- All affected population are equally eligible for compensation and rehabilitation assistance, irrespective of tenure status, social or economic standing and without and discrimination;
- The World Bank policies stipulate that displacement or restriction of access to resources must not occur before necessary measures for resettlement are put in place. This includes provision of compensation and other assistance required for relocation prior to displacement to new sites with adequate facilities. For compensation purposes, preference should be given to land-based strategies for displaced persons whose livelihoods are land-based with land equivalent to the advantages of the land taken. If land is not available, options built around opportunities for employment should be provided in addition to cash compensation for land and other assets lost. In case of land-based livelihoods, cash payment maybe appropriate if the land taken is a small fraction of the affected asset and the residual is economically viable particularly, and the displaced persons have the opportunity to use such markets. Cash compensation should be sufficient to replace the lost land and other assets at full replacement cost in local markets.
- In all cases, the displaced persons and host communities receiving them are to be provided with timely and relevant information, consulted on resettlement options and offered opportunities to participate in planning, implementing and monitoring resettlement and appropriate mechanisms for grievance redress are established. If is also important that in resettlement sites or host communities, public services and infrastructure are provided and measures are to be taken to the extent possible to preserve the social and cultural institutions. Special measures are to be taken to protect socially and economically vulnerable groups and people living in extreme poverty.

COMPENSATION ELIGIBILITY

All Project Affected Peoples (PAPs) whether public or private or cooperative, who will lose land, buildings, houses, crops or sources of income¸ will be compensated according to the types and amount of their losses. People with no titles to land will be compensated according to OP/BP 4.12 requirements and hence, squatters will also be supported so that they can lead a life at least equal to the one they had before they became affected by the project.
The cut – off date for compensation eligibility will be set once all detailed measurements have been completed. The cut-off date usually starts from the date of announcement of intention. Cultivating land, constructing buildings or settlements in the affected areas after the cut-off date will not be eligible for compensation. The cut-off date will be decided by Compensation and Relocation Committee in the shortest time possible so that affected persons to be able to restore their normal life as quickly as possible.

(a) Grievance Redress Mechanisms

A grievance redress committee will be set-up by the Infrastructure Implementation Unit, Ministry of Public Works to address complaints arising from the implementation of the resettlement action plan (RAP). The committee will ensure that all complaints received in writing (or written when received verbally) are documented and addressed document showing such donation, if there is a problem on the land, the project will be held back until the problem is solved or an alternative site is provided. **RAP monitoring Framework**

The purpose of monitoring is to provide project management, and directly affected persons, households and communities, with timely, concise, indicative information on whether compensation and resettlement activities are on track to achieve sustainable restoration and improvement in the welfare of the affected people, or that course adjustments are needed.

The monitoring framework consists of three components:

- Internal monitoring by IIU/MPW;
- Impact monitoring commissioned to specialized firms; and
- RAP Completion Audit

The scope of each type of monitoring is briefly described in the following sections and in Table 4.1along with the staffing, and resources needed for the monitoring program.

In order to effectively report on the effectiveness of the RAP implementation, the IIU will monitor the following key indicators, in keeping with World Bank requirements:

- Timely disbursement of compensation;
- Compensation disbursement to the correct parties;
- Public consultation and grievance procedures in place and functioning; and
- Physical progress of resettlement and rehabilitation, where applicable.

Monitoring will be based on indicators of change in:

- Delivery of Compensation;
- Resolution of grievances;
- Land assess;
- Increase or decrease in household assets;
- Social stability; and
- Human and environmental health.

Indicators will be in the form of:

- Done/not done, present/not present, achieved/not achieved etc.
- Easily measured, relevant quantities suitable for trend analysis; or
- Judgment of the affected people and their traditional authorities, as revealed by participative socio-economic survey and interviews.

The IIU/MPW will provide feedback on RAP implementation and ensure that adverse impacts on affected people are mitigated in timely manner. M & E will be the main mechanism to alert project management of any delays and problems and will help measure the extent to which the main objectives of the resettlement plan have been achieved. The Monitoring and Evaluation (M&E) activities will be supplemented and verified by monitoring efforts of experts specialized in resettlement issues or a government agency with the same function.

The establishment of appropriate indicators in the RAP is essential since what is measured is what will be considered important. Key performance indicators for monitoring are commonly divided into four categories for World Bank financial project:

(i) **Input:** Indicators include the resources in terms of people, equipment and materials that go into the RAP. Example of input indicators in the RAP include: the sources and amounts of funding for various RAP activities etc.
(ii) **Outputs:** Indicators concern the activities and services, which are produced with the inputs. Examples of output indicators in the RAP include (a) a database for tracking individual compensation; and (b) the payment of compensation for loss of land or assets.
(iii) **Process:** Indicators represent the change in the quality and quantity of access and coverage of the activities and services. Examples of process indicators in the RAP

include: grievance mechanisms; stakeholder channels; and information dissemination activities.

(iv) **Outcome:** Indicators include the delivery of compensation and other mitigation to avoid economic and physical displacement caused by the project. They measure whether compensation is paid and received, whether the affected populations who preferred cash compensation to in-kind resettlement assistance offered to them were able to use compensation payment for sustainable livelihood. The most important indicators for the RAP in the near term concern outputs, processes and outcomes since they define whether the planned level of effort is being made and whether early implementation experience is being used to modify/redesign the RAP features.

Over the medium to long term, outcome and impact indicators are critical since they ultimate measure of the RAP'S effectiveness in restoring people's livelihoods. Monitoring indicators may have to be defined or re-defined during the course of the project in response to changes to project –related conditions. Consequently, implementation and mitigation measures may have to be adopted to incorporate these Changes into the Monitoring and Evaluation Plan.

(a) Reporting

Progress will be reported for the following tasks in accordance with World Bank guidelines:

- Internal monitoring;
- Expert/External Monitoring;
- Completion audit; and
- Compensation.

Table: RAP Monitoring Framework

Component Activity	**Type of Information/data Collected**	**Sources of data/information collections method**	**Responsibility for data collection analysis and reporting**	**Frequency/Audience of Reporting**
Internal Performance Monitoring	Measurement of input, process, output and outcome indicators against proposed timeline and budget including compensation disbursement	Quarterly narrative status and compensation disbursement reports	IIU/MPW RAP Management Team	Semiannual or as required by the IIU/MPW RAP management team
Impact monitoring	Tracking effectiveness of input against baseline indicators assessment of affected people's satisfaction with input process and output	Annual quantitative and qualitative Surveys – Regular public meetings and other consultation with project affected people; review of	IIU/MPW including panel of experts.	Annual

Component Activity	Type of Information/data Collected	Sources of data/information collections method	Responsibility for data collection analysis and reporting	Frequency/Audience of Reporting
		grievance mechanism outputs		
Completion audit	Assessment that all components of the RAP were implemented with comparison of the RAP situation before and after RAP implementation	External assessment/sign-off report based on performance and impact monitoring reports independent surveys and consultation with affected persons.	Contracted external auditing and evaluation auditor, panel of experts.	On completion of RAP timetable

The Resettlement Policy Framework (RPF) is intended to guide the preparation of resettlement Action Plans (RAPs) during implementation of road Infrastructure project where needed. As land is relatively plentiful and almost all villages, towns and cities have land reserved for development activities and designated as town perimeter or reserve, no problem arises in acquiring land for such social services. Since all the proposed activities under the project are of a special interest to the communities and since the communities participate in most of the procedures in assigning land for such services through the land acquisition process it is expected that the process will proceed smoothly.

Despite the expected smooth process in acquiring land for the project, it is important to provide procedures for the preparation of Resettlement Action Plans (RAPs) in case needed in other phases of the project.

Procedures for preparation of RAPs are detailed World Bank OP 4.12which outlines the minimum elements to be included. Beside the consideration of the policy and legal requirements, RAP must survey the affected persons, their property and means of access to resources and to determine types of assistance needed bearing in mind the resettlement principles outlined in section (2.2). The RAP must identify compensation for loss of land, compensation for houses, loss of employment, business and allowance for moving or any other losses that may happen as the result of the project. In determining the extent of impacts on affected persons, the compensation and Resettlement Committee as outlined in section (4.2) will be responsible for planning, coordinating and monitoring compensation and relocation activities and settle any grievances.

APPENDIX D - ENVIRONMENTAL, SOCIAL, HEALTH AND SAFETY (ESHS) METRICS FOR PROGRESS REPORTS

The Project Company shall monitor, keep records and report on the following environmental and

social matters[4],[5]:

1. *Availability of Key Personnel:* ESHS Manager, Environmental Management Specialist; Social Management Specialist; Health and Safety Specialist; Community Relations Manager.

2. *Safety*: hours worked, recordable incidents and corresponding Root Cause Analysis (lost time incidents, medical treatment cases), first aid cases, high potential near misses, and remedial and preventive activities required (for example, revised job safety analysis, new or different equipment, skills training, and so forth).

3. *Environmental incidents and near misses*: environmental incidents and high potential near misses (dust, erosion, blasting, spills, habitat degradation) and how they have been addressed, what is outstanding, and lessons learned.

4. *Traffic accidents (project vehicles and non-project vehicles):* provide date, location, damage, cause, follow-up.

5. *Status of permits and agreements:* areas/facilities with permits required (quarries, asphalt & batch plants), areas with landowner agreements required (borrow and spoil areas, camp sites).

6. *Major works*: those undertaken and completed, progress against project schedule, and key work fronts (work areas).

7. *ESHS requirements*: noncompliance incidents with permits and national law (legal noncompliance), project commitments, or other ESHS requirements.

8. *ESHS inspections and audits*: by Project Company, Independent Engineer, Contracting Authority, or others—to include date, inspector or auditor name, sites visited and records reviewed, major findings, and actions taken[6].

9. *Workers*: number of workers, indication of origin (expatriate, local, nonlocal nationals), gender, age with evidence that no child labour is involved, and skill level (unskilled, skilled, supervisory, professional, management).

10. *Accommodations:* status of accommodations' compliance with national and local law and good practice; actions taken to recommend/require improved conditions, or to improve conditions.

11. *ESHS Training (including HIV/AIDS and SEA/SH, and training in communities)*: including dates, number of trainees, and topics.

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[4] Adapted from Managing Contractors' Environmental and Social Performance. IFC Good Practice Note, 2017. https://www.ifc.org/wps/wcm/connect/87197a95-1b7f-4f57-ac1e-ee961730ce4d/p_GPN_ESContractorManagement.pdf?MOD=AJPERES&CVID=mcsUYYc

[5] To be included in the C-ESMP

[6] Data on the prevalence of SEA/SH shall not be collected directly and audits shall focus on making sure that the mitigation and response measures are in place and working accordingly

12. *Footprint management*: details of any work outside boundaries or major off-site impacts caused by ongoing construction—to include date, location, impacts, and actions taken.

13. *External stakeholder engagement*: highlights, including formal and informal meetings, and information disclosure and dissemination—to include a breakdown of women and men consulted and themes coming from various stakeholder groups, including vulnerable groups (e.g., disabled, elderly, children, etc.).

14. *Details of any security risks*: details of risks the Project Company may be exposed to while performing its work—the threats may come from third parties external to the project.

15. *Worker grievances*: details including occurrence date, grievance, and date submitted; actions taken and dates; resolution (if any) and date; and follow-up yet to be taken grievances listed should include those received since the preceding report and those that were unresolved at the time of that report.

16. *External stakeholder grievances*: grievance and date submitted, action(s) taken and date(s), resolution (if any) and date, and follow-up yet to be taken grievances listed should include those received since the preceding report and those that were unresolved at the time of that report. Grievance data should be gender disaggregated.

17. *Major changes to Project Company's environmental and social practices*.

18. *Deficiency and performance management*: actions taken in response to previous notices of deficiency or observations regarding ESHS performance and/or plans for actions to be taken should continue to be reported to the Contracting Authority until it determines the issue is resolved satisfactorily.