A. Introduction

1. The Democratic Socialist Republic of Sri Lanka has received a Loan from the Asian Development Bank (ADB) which will be utilized for installation of multi-lane free flow electronic toll collection system (MLFF-ETC) contract under SASEC Port Access Elevated Highway (PAEH) Project. Part of this loan proceeds will be used for providing the Project Management Consultancy Service for the MLFF-ETC.

2. The executing agency for the Project is the Ministry of Highways & Road Development and Petroleum Resources Development (MOHRD & PED) and the Employer is the Road Development Authority (RDA).

3. PAEH commences from Ingurukade Junction and ends at Galle Face traverses through Sri Lanka Ports Authority (SLPA) premises. The total length of the 4-lane elevated highway is 5.3km. Entry/exit ramps at both ends of the road as well as at an appropriate location in Colombo port area and provision for Pettah ramp will be constructed. The proposed PAEH is an urban toll expressway to be connected to Colombo-Katunayake Expressway (CKE) via New Kelani Bridge (NKB).

4. RDA has expanded its expressway network since the Southern Expressway, Sri Lanka’s first expressway, was opened to traffic in 2011. CKE and a part of Outer Circular Highway (OCH) have been in operation since 2013 and 2014, respectively.

5. Current toll collection system in Sri Lanka have been historically developed on a project-to-project basis; therefore, the toll collection systems differ among expressways. However, once the rest of the OCH is completed, the three expressways will be connected with each other. The planned new Central Expressway leading to OCH will also join the network. Furthermore, the New Kelani Bridge, funded and implemented by the Japan International Cooperation Agency (JICA), links the Colombo–Katunayake Expressway to the proposed toll elevated highway; the proposed PAEH project will become a part of the expressway network. Giving an eye on the expressway operation, the expansion of the expressway network will require a comprehensive, modern, and consistent toll collection system.

6. Given the background above, RDA decided to introduce the multi-lane free flow electronic toll collection system (MLFF-ETC) with the technologies of RFID and automatic number plate recognition (ANPR) for enforcement. MLFF-ETC is a new toll collection system to Sri Lanka; it will be applied to all expressways including PAEH, NKB, CKE, OCH, Southern Expressway, and other expressways under construction. Contract of MLFF-ETC will include design of the total ETC system, issuance of RFID tags, construction of gantries, supply of road side equipment including RFID reader, Surveillance camera, Speed camera and ANPR, payment clearance system, minimum 3-year operation and maintenance service, marketing, and customer services.

7. The main objective of this consultancy is to assist the RDA ("Employer") in managing, implementing and operating the MLFF-ETC project ("Project"). RDA has no previous internal experience of managing and implementing MLFF-ETC; therefore, the consultancy will totally support RDA in all aspects of management, implementation, and operation of MLFF-ETC.
8. The Project Management Consultant (PMC) includes, but not limited to, overall MLFF-ETC project (“Project”) management support, finalization of basic specification of MLFF-ETC system, support for creating implementation scheme and enabling environment, preparation for bid documents, support for evaluation of bids, review of contractor’s detailed design, monitoring progress of the implementation, witness of contractor's testing and operational trials, verification of system operation, monitoring service performance and contract management.

9. The total length of the service will be 40 months, including 15 months for pre-bid and procurement stages, 1 month for mobilization of contractor, 18 months for MLFF-ETC implementation stage, and 6 months for MLFF-ETC initial operation stage.

<table>
<thead>
<tr>
<th>Description</th>
<th>Month</th>
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<tbody>
<tr>
<td>Identification of System, Preparation of Bidding Documents &amp; Bidding</td>
<td>15</td>
</tr>
<tr>
<td>Construction supervision of Civil works Contractor</td>
<td>18</td>
</tr>
<tr>
<td>Maintenance and Operation</td>
<td>6</td>
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</tbody>
</table>

10. The procurement is expected to be carried out with two-stage two-envelope method in accordance with ADB’s Procurement Policy and Procurement Regulations.

B. Scope of the Consultant Services
The services are described below.

1. General Task
   (i) Support institutional and modality arrangement with clear roles and responsibilities of each party for MLFF-ETC implementation and operation,
   (ii) Support creation of enabling environment for introducing MLFF-ETC for total Expressway network,
   (iii) Examine technical requirements for communication, monitoring, and traffic management systems used for expressway management to be integrated with MLFF-ETC,
   (iv) Advise RDA on transforming from present toll system to MLFF-ETC,
   (v) Prepare bidding documents including technical specifications and service agreement,
   (vi) Assist in procurement process including the evaluation of technical bids,
   (vii) Review all designs submitted by the Contractor
   (viii) Monitor the Project implementation schedule with milestones and critical analysis,
   (ix) Test and verify functionality of MLFF-ETC installed by the contractor,
   (x) Monitor and audit ongoing operational service performance,
   (xi) Identify implementation and operational issues of the contractor, and propose practical solutions, and
   (xii) Prepare reports as required for the Employer and ADB.

2. Specific Tasks

   Component 1: Overall Project Management
   Task 1.1: Overall Project Management

   (i) Provide project management services throughout design, procurement, construction, and commissioning, and operation stages. The consultant is to maintain and update the project schedule throughout the project, and undertake project performance management system for MLFF-ETC in the format acceptable to the Employer and ADB, which
consists of (1) preparing in the initial stage a project performance management system, in accordance with the ADB's project design and monitoring framework, to monitor (i) the progress of the overall MLFF-ETC project implementation, and (ii) the development impact of the MLFF-ETC project; and (2) collecting/updating the project performance indicator benchmarks.

(ii) Prepare (i) monthly reports on project progress and other issues; and (ii) prepare a project completion report when the project is substantially completed.

(iii) provide on-site training wherever required for Employer’s staff on quality assurance, contract administration and other project management activities.

(iv) Arrange overseas study tours and trainings for MOHRD & PRD and RDA staff to understand implementation and operation issues of MLFF-ETC.

(v) Provide any of the following as additional services: (i) prepare reports, including technical appraisals, additional contract documentation, and/or review and comments on the Contractor’s proposals, as may be required or the successful completion of the Project; and (ii) provide any other specialist services as may be required from time to time if so required by the Employer.

Task 1.2: Contract Management

(i) Throughout the service period, the PMC shall:

- oversee all contractual obligations such as certification of achievement of milestones
- review requests for certificates under the contract where required
- produce recommendations with regards to payments due to the contractor, and process interim and final payments
- Reconcile monitoring data with contractor’s payments
- hold day to day technical and administrative progress meetings with contractor
- Issue a notice to the Contractor to carry out remedial measures established any defects or deficiencies in the requirements
- evaluate and recommend to the Employer of contractor’s proposal for variations, claims and the rates for any unscheduled items of work that may arise
- ensure that project financial management procedures are in order and are strictly followed, specifically relating to payments, financial accounting, financial reporting and record keeping
- maintain records, correspondence and diaries and submit all the key documents and records to the Employer at the completion of the contract
- provide other contract management services as required

Component 2: Pre-Bid Stage Services

Task 2.1: Stakeholder Coordination

(i) Prepare a stakeholder management plan that assesses groups, interested parties, banks, payment clearance system holders, relevant civil works contractors for expressways, and relevant government agencies.

(ii) Identify level of appropriate engagement to support delivery and operation of the MLFF-ETC charging scheme.

(iii) Produce a statement of requirements which sets out the underlying requirements for the MLFF-ETC charging scheme.

Task 2.2: Organization Architecture Development

(i) Assess capacity of stakeholders including relevant government agencies to implement MLFF-ETC in accordance with the statement of requirements.

(ii) Produce a blueprint for an organizational architecture that sets out optimal structure, modality, and responsibilities of relevant stakeholders that will be involved in the delivery and operation of MLFF-ETC.
(iii) Propose organizational and staffing requirements for the Employer to provide MLFF-ETC services under the proposed responsibilities.

Task 2.3: Creation of Enabling Environment

(i) Carry out a review of regulatory environment including both implementation and operation aspects. The review includes, but not limited to, permission to construct gantries for toll collection, legislation required to enforce payment of tolls, regulation to allow the service provider to access vehicle registration database, and other regulatory requirements for data protection / user privacy / information security. To obtain practical results in the context of Sri Lanka, the review should be conducted in consultation manner with legislation or regulation authorities/agencies as well as other ETC experts including that to be hired by ADB.

(ii) Based on the review, make time-bound action-oriented practical recommendations for any necessary changes to legislation or regulations required to introduce MLFF-ETC.

(iii) Support amendment work for the legislation or regulation required for the introduction of MLFF-ETC to achieve the proposed timeline and actions.

(iv) Prepare a practical transition plan for the existing expressways from the manual toll collection or existing electronic toll collection to the proposed MLFF-ETC.

Task 2.4: Definition of the Project scope

(i) Based on the previous tasks, define and propose scope of the Project with implementation responsibilities of each party concerned.

(ii) Prepare preliminary cost estimates for MLFF-ETC in line with the Project scope defined in the above.

Component 3: Procurement Stage

Task 3.1: Market Sounding for Information Gathering

(i) Hold meetings to invite potential bidders to explain the Project background and concept, policy environment, scope of the Project, basic technical requirements, responsibilities of the contractor and the Employer, procurement method, and implementation and operation timeline.

(ii) Collect from the participants suggestions, responses, and concerns about the Project to be reflected in bidding documents.

Task 3.2: Definition of Technical Requirements and service agreement

(i) Carry out detailed technical requirement capture analysis, including not only technical specification of the system but also investigation of physical locations and technical requirements of gantries and related facilities.

(ii) Produce detailed statement of Employer’s requirements which set out all technical, functional, serviceability, and performance requirements to be met by the contractor’s solution.

(iii) Prepare personnel requirements of the contractor to implement MLFF-ETC.

(iv) Prepare draft service agreement for the operation of MLFF-ETC to maintain the functional and performance requirements as well as to satisfy institutional requirements to be carried out by the contractor.

(v) Review and assess long term availability of system maintenance support and spare parts.

(vi) Review and assess on system change request / upgrade / future integration support.

(vii) Review and finalize the cost estimates with categorized pricing schedules.
Task 3.3: Preparation of bidding documents
(i) Prepare bidding documents including evaluation criteria, Employer’s requirements, and draft contract together with service agreement in accordance with ADB’s Procurement Policy and Procurement Regulations.
(ii) Ensure at least all aspects described in Task 4.1 shall be included in Employer’s requirements and/or other parts of the bidding documents as requirements of bidders’ proposals.
(iii) Consider in the preparation of technical specifications parameters which could be obtained from MLFF-ETC (e.g. traffic volume, sections used) to be used for expressway and traffic management purpose.

Task 3.4: Procurement Support
(i) Assist the Employer in advertising, issuing bidding documents, responding to queries, and receiving bids.
(ii) Assist the Employer in evaluating bids, reviewing technical specifications and other requirements, negotiating the contract, and other procurement-related activities.

Component 4: Implementation Stage
Task 4.1: Review of the contractor’s detailed design
(i) Review the following, but not limited to, documents on behalf of the Employer to confirm compliance with Employer’s requirements:
- Contractor’s proposal for MLFF-ETC demonstrator
- Contractor’s project implementation plan
- Contractor’s quality management documentation
- Contractor’s system design document

(ii) Carry out a detailed review as appropriate of the following aspects of the contractor’s proposal:
- Gantry structural designs
- Gantry site detailed proposal
- Sub-contractor proposal
- RFID tag design
- RFID tag supply arrangements
- Customer contact center proposals
- Charging algorithms/ methods
- Toll payment account proposals including customer service processes
- Enforcement systems and operational processes
- Call center proposals
- IT/ back-office solutions
- Arrangements for special groups of customers/ exempt users
- Integration with manual toll operations
- Interfaces with existing toll collection systems and plazas
- Monitoring and reporting proposals
- Risk register

Task 4.2: Witness of testing and operational trials
(i) On behalf of the Employer, attend and witness tests of whole or parts of the systems required by the contractor’s test program in order to meet the requirements of the contract with respect to the testing.
(ii) On behalf of the Employer, attend and witness end to end trials of system operations required by the contractor’s trials program in order to meet the requirements of the contract with respect to trialing or MLFF-ETC services before the live operation.

Component 5: Service Delivery and Operation Stage
Task 5.1: Verification of Correct System Operation
(i) Verify correct operation of the system after the initial implementation including correct collection of toll revenue for all links in the road network under the toll system.
(ii) Verify that the contractor has achieved the required performance levels after commencement of operation as defined in the contract.

Task 5.2: Monitoring/ Auditing of Ongoing Service Performance
(i) Monitor operational information including, but not limited to, user accounts, revenue reports, and transaction reports to ensure that technical or operational issues are identified, understood, and addressed.
(ii) Provide a control function to ensure that those issues are being identified by the contractor, and appropriate remedial measures are being identified and correctly implemented by the contractor.

Task 5.3: Management of Changes to System
(i) Review the contractor’s plans for the expansion of the MLFF-ETC onto additional sections of expressways where required by the Employer after initial introduction of the system and monitor the testing and implementation of such expansion.

C. Assignment period and Engineer Inputs
1. This assignment will be carried out by international firm/s in association with national consultant firm/s, to be selected by the Employer in accordance with ADB’s Guidelines on Quality and Cost Based Selection (QCBS).
2. The service period will be 40 calendar months including 18 months for MLFF-ETC implementation stage and 6 months for MLFF-ETC initial operation stage.
3. A total of 58 International Experts person-month inputs and 110 National Experts person-months inputs will be required. (Key experts 128 and Non-Key experts 40)
4. All International and National Key expert must be professionally qualified. The Key and Non-Key positions are given in the table below.

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<tr>
<th>Proposed Positions</th>
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<tbody>
<tr>
<td><strong>Position</strong></td>
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<tr>
<td><strong>IC International</strong></td>
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<tr>
<td>Key Experts</td>
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<tr>
<td>IC1 MLFF-ETC Management Specialist/ Team Leader</td>
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<tr>
<td>IC2 MLFF-ETC Test and Trial Specialist – 1</td>
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<tr>
<td>IC3 MLFF-ETC Test and Trial Specialist - 2</td>
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<tr>
<td>IC4 Payment Services and Back Office IT Specialist</td>
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<tr>
<td>IC5 MLFF-ETC Enforcement Specialist</td>
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<tr>
<td>IC6 Institutional Management Specialist</td>
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<tr>
<td><strong>Total (International)</strong></td>
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<tr>
<td><strong>N National</strong></td>
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<tr>
<td>Key Experts</td>
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<tr>
<td>N1 Senior Electronic Telecommunication Specialist Deputy Team Leader</td>
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<tr>
<td>N2 Customer Service Specialist</td>
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<tr>
<td>N3 Financial Management Specialist</td>
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<td>N4 Procurement Specialist</td>
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Qualification descriptions of each expert are as follows;

**International Experts**

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<thead>
<tr>
<th>IC</th>
<th>Role</th>
<th>Qualification</th>
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</table>
| IC1  | MLFF-ETC Management Specialist/ Team Leader | - Professionally qualified BSc IT/computing, telecommunications or electronic engineering, with post graduate qualifications  
- Minimum 20 years professional experiences in transport, communication or IT sector  
- Minimum 10 years working experience in electronic toll collection and/or electronic charging system, preferably in expressways  
- At least 5 years’ experience as a Team Leader.  
- Should have experience in project management services of similar scope and contract modality. |
| IC2  | MLFF-ETC Test and Trial Specialist – 1 (equipment) | - Professionally qualified BSc IT/computing, telecommunications or electronic engineer, with post graduate qualifications  
- Minimum 15 years professional experiences in transport, communication or IT sector  
- Minimum 7 years working experience in installing and/or testing gantries, RFID systems, ANPR, and other related equipment for MLFF-ETC  
- Should have experience in testing of equipment functionality of MLFF-ETC or similar projects. |
| IC3  | MLFF-ETC Test and Trial Specialist – 2 (IT solution) | - Professionally qualified BSc IT/computing, telecommunications or electronic engineer, with post graduate qualifications  
- Minimum 15 years professional experiences in transport, communication or IT sector  
- Minimum 7 years working experience in developing and/or testing charging algorithms, payment reconciliation and clearing system, and other related system necessary for MLFF-ETC operations  
- Should have experience in testing of IT system of MLFF-ETC or similar projects. |
| IC4  | Payment Services and Back Office IT Specialist | - Professionally qualified BSc IT/computing, telecommunications or electronic engineer, with post graduate qualifications  
- Minimum 15 years professional experiences in transport, communication or IT sector  
- Minimum 7 years working experience in developing and/or supervising payment reconciliation and clearing system, database access, IT management system, information security, and other related system necessary for MLFF-ETC  
- Should have experience in developing IT system of MLFF-ETC or similar projects. |
| IC5  | MLFF-ETC Enforcement Specialist | - Professionally qualified relevant bachelor’s degree such as IT/computing, telecommunications, public administration, and public policy, with post graduate qualifications |
qualifications

- Minimum 15 years professional experiences in transport or communication sector
- Minimum 5 years working experience in electronic toll collection system, enforcement of charging system, and/or expressway management
- Preferably have experience in MLFF-ETC project

IC6 Institutional Management Specialist

- Professionally qualified relevant bachelor’s degree such as public administration, public policy, business administration, economics with post graduate qualifications
- Minimum 10 years professional experiences in institutional management
- Preferably have experience in MLFF-ETC project

Key National Experts

<table>
<thead>
<tr>
<th>N1</th>
<th>Senior Electronic Telecommunication Engineer / Deputy Team Leader</th>
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<tr>
<td></td>
<td>• Professionally qualified BSc Engineering in computing, telecommunications, or electronic engineering. Post graduate qualification is preferred.</td>
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<td></td>
<td>• Minimum 15 years professional experiences in transport, communication or IT sector</td>
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<td></td>
<td>• Minimum 5 years working experience in expressway management, expressway operation, and/or electronic payment/toll collection business</td>
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<td>• Should have experience in project management services of similar contract modality</td>
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<th>N2</th>
<th>Customer Service Specialist</th>
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<tr>
<td></td>
<td>• Professionally qualified BSc business administration, telecommunications or equivalent</td>
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<td></td>
<td>• Minimum 7 years professional experiences in customer service development or management</td>
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<td></td>
<td>• Preferably have experience in customer service development or management in public utility or transport sector.</td>
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<th>N3</th>
<th>Financial Management Specialist</th>
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<tr>
<td></td>
<td>• Professionally qualified BSc finance, business administration, accounting, economics or equivalent.</td>
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<td></td>
<td>• Minimum 10 years working experience in financial management, accounting, and business administration</td>
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<td>• Should have experience in infrastructure-related projects, preferably in transport sector</td>
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<th>N4</th>
<th>Procurement Specialist</th>
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<td></td>
<td>• Professionally qualified BSc engineer, law, economics, public administration or equivalent.</td>
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<td></td>
<td>• Minimum 10 years working experience in procurement activities in public sector</td>
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<td></td>
<td>• Should be familiar with lump-sum contract modality and ADB Procurement Policy and Procurement Regulations</td>
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<td></td>
<td>• Should have experience in contract management for ADB or other development partner funded projects, preferably in transport sector</td>
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<tr>
<th>N5</th>
<th>Legal/ Contract Management Specialist</th>
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<tr>
<td></td>
<td>• Professionally qualified BSc law, contract management, engineering management or equivalent.</td>
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<td>• Minimum 10 years working experience in contact management including lump-sum contracts</td>
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<tr>
<td></td>
<td>• Should have experience in contract management for ADB or other development partner funded projects, preferably in transport sector</td>
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Non-key National Experts
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<thead>
<tr>
<th>L1</th>
<th>Junior IT Specialist</th>
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<tr>
<td></td>
<td>• Professionally qualified BSc Engineering, IT/computing, or telecommunications.</td>
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<td></td>
<td>• Minimum 3 years working experience in IT/computing or telecommunications.</td>
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<td></td>
<td>• Preferably, have experience in public utility/ infrastructure sector</td>
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D. Reporting Requirements

The Consultant shall submit the following reports (each in 6 hardcopies & a softcopy) and documents to the RDA during the course of the services.

- Inception Report [including initial finding, project schedule, staff mobilization schedule, and recommendations if any within 1.0 months from the commencement date]
- Monthly Progress Report [Brief details of the work carried out during the previous month (all components), the problems encountered or anticipated, together with the steps taken or recommendations for their correction, and financial and physical progress to date by 10th of on-going month following the inception report]
- Draft / Final Bidding documents for selection of contractors.
- Monthly Design Review Report [Detailed design submitted and reviewed and accepted during the month]
- Draft Final Report and Project Completion Report [in accordance with ADB’s format within 3.0 months from the completion of the construction]
- Any other reports requested by the Project Director related to the Project.

E. Facilities Provided by the Employer

The Employer will provide;

(i) Visa supporting letters and registrations for host country
(ii) Supporting letter to obtain entry pass at Ports Authority
(iii) Relevant project data and reports
(iv) Access to data, records, and other information required to perform the assigned tasks

F. Facilities Provided by the Consultant

The Consultant will provide;

(i) Furnished Office with adequate space and equipment
(ii) All necessary supporting staff
(iii) Vehicles for transport including traveling to Site
(iv) Communication
(v) Any other services required to complete the tasks.