

**Terms of Reference for Consulting Firm: Preparatory facility to improve Dhaka-
Chattogram Freight corridor**

[Update of feasibility studies and preparation of Environmental and Social Framework (ESF) documents for: (i) Faujdarhat to Chattogram Goods Port Yard (CGPY) rail link improvement and CGPY Yard improvement; (ii) freight locomotives; (iii) Bay Terminal Link and preparing procurement documents for these investments and for Locomotives, Relief Crane and Wheel Lathe facilities (iv) New feasibility studies for: rail link connecting Mirsharai Economic Zone logistics hub with Dhaka-Chattogram railway corridor]

Background

Bangladesh Railway (BR) is an agency of the Government of Bangladesh (GoB) that provides railway infrastructure, passenger services and freight services in Bangladesh. The railway is vertically integrated and does not currently allow private operators. BR is headed by a Director General, supported by functionally organized Additional Directors General (for rolling stock, infrastructure, finance, marketing and planning, and operations). Operations are organized geographically between East and West and subdivided into geographical divisions. Ministry of Railways oversees BR and formulates rail policy. Railway prices require approval by the Cabinet of Ministers.

BR operates a network of just over 3000 route-km. The network was originally broad gauge (1676 mm) in the Western half and meter gauge (1000 mm) on the Eastern half. BR has investment projects underway or in study to dual gauge the meter gauge corridor between Chattogram and Tongi, allowing interoperability between East and West, and to double track key lines. The overall standard to be achieved is 60 km/ph for freight and 120/100 km/ph (broad/meter) for passenger. A variety of signaling exists, with Computer Based Interlocking (CBI) the standard to be achieved.

Bangladesh railway is primarily a passenger railway—it carried 63 to 93 million passengers per year in the last ten years and 3 to 4 million tons of freight per year. Use of infrastructure (measured by train-km) is about 90 percent passenger and 10 percent freight.¹ The Government pays BR a small formal PSO and welfare grant and covers the balance of BR costs through budget allocations.

Freight accounts for about 10 percent of BR's train-km and a quarter of its revenue from traffic, suggesting that adding freight traffic would be profitable for BR and improve its cost recovery. Container transport between Dhaka and Chattogram is a market in which BR has already been successful, and with improved services could expand its business. Cross border trade with India (and through-India trade with Bhutan and Nepal) is another developing freight market. Beyond improving BR's finances, expanding BR freight business would benefit

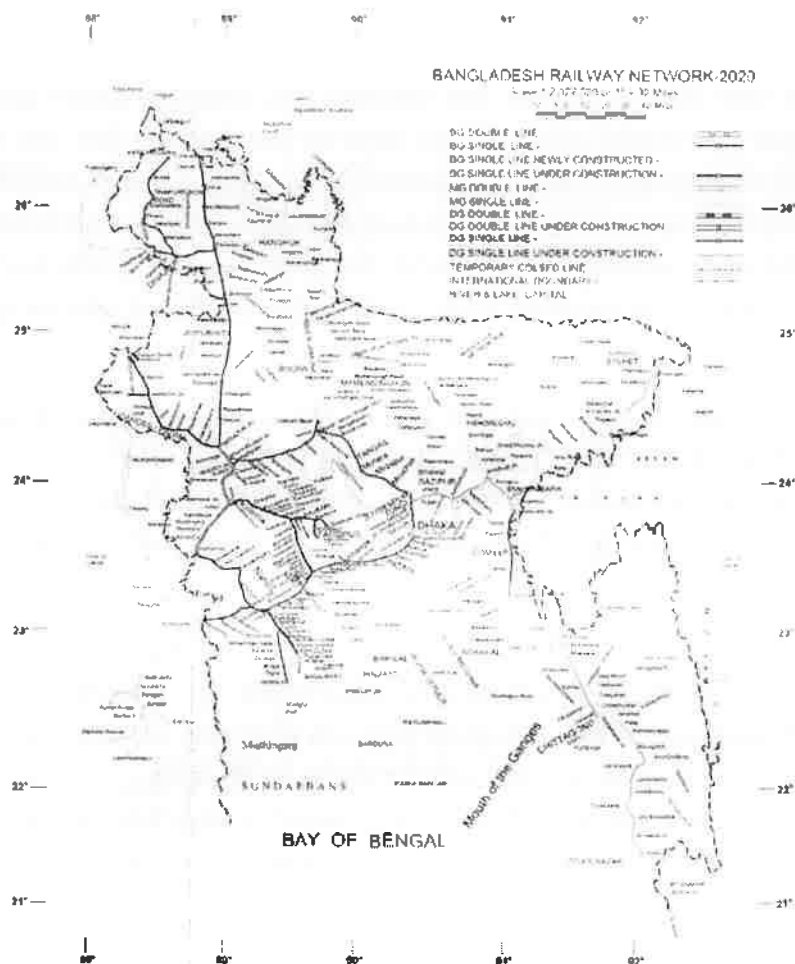
¹ Figures are taken from BR financial reports. FY 2019/2020 FY was used because BR indicates that its difficulties in converting to a computerized accounting system has rendered the more current reports unreliable.



Bangladesh by taking traffic off heavily congested roadways, improving freight logistics and reducing GHG emissions, accidents, and other negative effects of road transport.

The World Bank has received a request from the GoB to finance improvements to the rail facilities and rolling stock serving the Dhaka-Chattogram corridor, including:

- Improvements to Chattogram Goods Port yard (CGPY) and conversion of the Fouljadarhat-CPGY single track, meter-gauge line into a double track, dual gauge line including a dual-gauge provision for turning locomotives
- Construction of a greenfield link line from CGPY to the Bay Terminal
- Construction of a greenfield link line from the Dhaka – Chattogram railway to connect to the Mirsharai Economic Zone and Logistics hub
- Procurement of 20 number meter gauge freight locomotives, a Relief Crane, a loco-shed and a Underfloor Wheel Lathe
- Provision of a meter gauge underfloor wheel lathe facility and a meter gauge loco-shed at CGPY
- Track machine maintenance facility and track maintenance equipment
- Provision of a 80-100 tons meter gauge relief crane to be based at CGPY

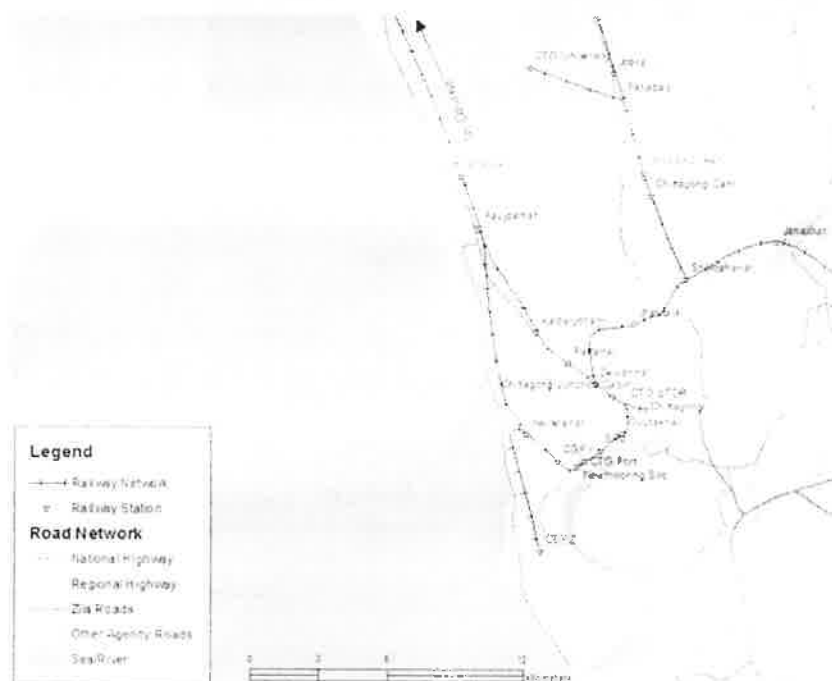


Source: Bangladesh Railways web site

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Existing Chattogram Goods Port yard (CGPY)

At present the railway has a huge port terminal yard (CGPY) consisting of a six-line down receiving yard, a six-line up dispatch yard, a 16-line down sorting yard, a 17-line up sorting yard, and a sick line for goods stock running maintenance facilities along with locomotive maintenance. These facilities cover an area of about 1.5 square kilometres.



Source: KS Consultants Ltd Strategic Master Plan Chittagong Port Sept 2015



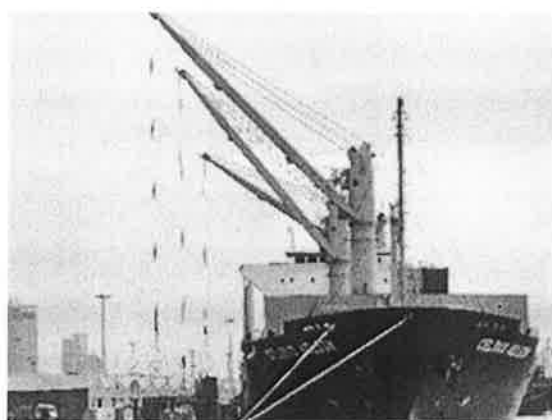
Faujdarhat April 2022



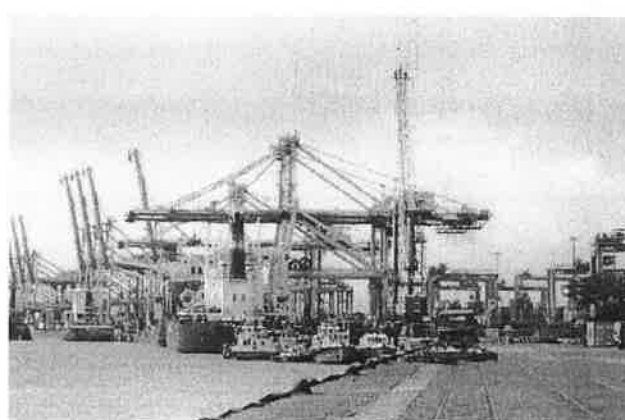
Yard light maintenance April 22



Yard train formation April 22



Chattogram Port off-load container to lorry April 2022



Chattogram Port off-load locomotives to rail April 2022

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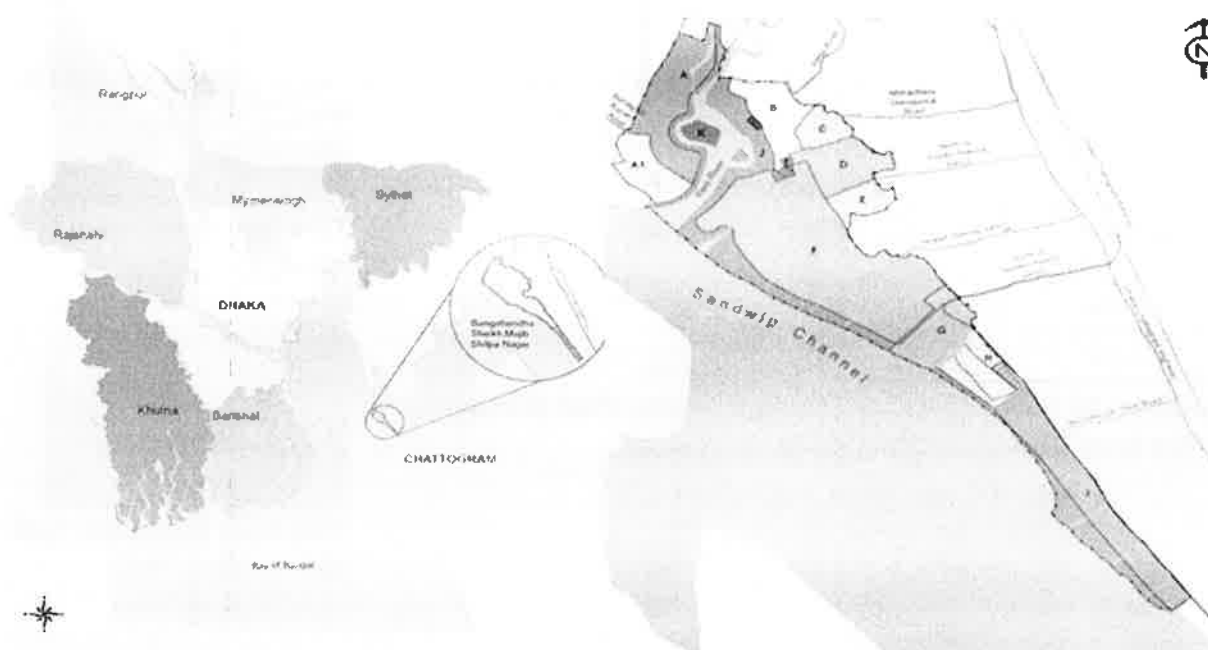


Chattogram Port train loading facilities
April 22



Chattogram Port shunter turn back April 2022

Mirsharai Economic Zone site Location



Source: WB SEP for Private Investment and Digital Entrepreneurship Project (PRIDE) Feb 2020

Source: adopted from [beza.gov.bd/economic-zones-site map](http://beza.gov.bd/economic-zones-site-map)

The Mirsharai Economic Zone site is located 200 kilometres (km) from Dhaka, 60 km from Chattogram, 70 km from Chattogram Port and the Shah Amanat International Airport and 330 km from Sylhet.

The BSMSN area is not directly connected by rail. The Dhaka-Chattogram railway line running almost parallel to the highway (N1) is about 10 Km from the proposed site. BEZA proposes to connect the Mirsharai Economic Zone and Logistics hub by rail to BR's Nizampur station (approximately 16 km), on Dhaka-Chattogram railway corridor.

For the World Bank to finance investments in rail facilities in these areas, their technical and economic feasibility must be confirmed, vulnerability to climate and other disasters must be

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assessed and mitigated, bidding documents must be prepared, and social and environmental issues must be reviewed.

Objective

The objective of this assignment is to prepare a bankable feasibility study, covering the technical, social, environmental (includes computing carbon emission inventory), and economic and financial viability for the specified investments and prepare tender documents for procurement of them.

Scope of Work

The Consultant shall undertake the following tasks. Throughout this assignment, the Consultant shall work closely and collaboratively with staff from BR, so that their analysis is well understood and concerns of BR have been addressed.

Task 1: Literature Review, Initial Interviews, Site Visit, and Inception Report

The Consultant shall develop a contextual understanding of BR and its freight operations through the following activities.

1.a. Review existing studies and reports related to the proposed project investments. These would include, but not limited to:

- Asian Development Bank, *Technical Assistance for Dhaka-Chittagong-Cox's Bazar Rail Project Preparatory Facility Final Feasibility Study Report*, prepared by CANARAIL et al. [hereinafter: CANARAIL Feasibility Study]
- Asian Development Bank, *People's Republic of Bangladesh: South Asia Sub-regional Economic Cooperation Railway Connectivity Investment Program, Final Report on Rolling Stock Maintenance (2017)*, prepared by CPCS Transcom [hereinafter: CPCS Rolling stock Maintenance Study]
- CRDC-ME Consortium, *Feasibility Study & Detail Design for Construction of a Railway Link to Proposed Bay Terminal of Chattogram Port (2023)*
- World Bank, *Railway sector review and preparation of roadmap for cross-border rail services in Eastern South Asia: Inception Report (May 2023)*, prepared by Deloitte.
- World Bank, *Increasing Rail Freight on Bangladesh Railways (2023)*
- Bangladesh Economic Zones Authority (BEZA) *Mirsharai Economic Zone Master Plan (Sept 2020)*

1.b. Conduct initial interviews with BR staff concerned with investment requirements and operations. This would include, but not limited to:

- Staff/department 1 : Concerned engineering departments of Bangladesh Railway.
- Staff/department 2 : Traffic and commercial department of Bangladesh Railway.

1.c. Visit the rail facilities in the Chattogram Port area.

1.d. Visit the BSMSN Port and Logistics area and the rail facilities at Barotakia, Mirsharai and Sitakunda on the Dhaka-Chattogram railway corridor.

Based on this initial review, the Consultant shall prepare an **Inception Report**, outlining its findings and confirming or proposing changes to its work plan.

Task 2: Traffic & Revenue Forecast

The Consultant shall review and update the traffic and revenue forecast from the CANARAIL Feasibility Study for the rail traffic to/from Chattogram Port. The Consultant shall review and update the BEZA forecast traffic volumes for Mirsharai Economic Zone rail traffic to/from the Mirsharai Economic Zone and Logistics area.

The review should take into consideration recent economic trends, development in the type and volume of port traffic, changes in regional trade relationships, competition from alternative transport modes, and other market developments. Based on this review the Consultant shall prepare a robust traffic and revenue forecast to 2035.

The Consultant shall identify the main factors that affect traffic demand and willingness to pay for rail freight services and use them to conduct sensitivity analysis. The Consultant shall prepare three traffic scenarios—pessimistic, most likely, optimistic—that show the impact of varying the key demand drivers.

The results of this analysis will be summarized and presented in the **Assessment Report**.

Task 3: Operational Assessment

The Consultant shall review BR freight operations to/from the port of Chattogram and how that operation would evolve to handle the forecast traffic volumes. The Consultant shall independently assess and confirm the requirement for the capacity expansion and dual gauging proposed. The Consultant shall review the feasible alternatives and discuss with BR any potentially superior alternatives to the infrastructure investments proposed.

For the Bay Terminal link line, the Consultant shall review the alignment alternatives and analyze the operational benefits and dis-benefits of the alignment options. The Consultant shall discuss with BR any potentially superior alternatives to the alignment proposed.

For the proposed rail link between the Mirsharai Economic Zone and Logistics area and the Dhaka-Chattogram railway corridor the Consultant shall review the alignment alternatives and analyze the operational benefits and dis-benefits of the alignment options, and how that operation would evolve to handle the BEZA forecast traffic volumes for Mirsharai Economic Zone .

For the Infrastructure Maintenance Depot, the Consultant shall review options for mechanizing track maintenance on the Dhaka-Chattogram corridor, the need for track maintenance machinery and the proposal to basing a mechanized track maintenance unit in Chattogram area. The Consultant shall discuss with BR any potentially superior alternatives to site proposed. The Consultant shall review BR's maintenance practices and confirm the requirement for the track maintenance equipment investments.

For the Rolling Stock procurement, the consultants shall review the requirement of locomotive, relief crane and under floor wheel lathe, loco shed and facility for turning locomotives at CGPY for the smooth operation of the train over existing and newly constructed tracks.

The results of this analysis, and the consultant's confirmation of the suitability of the agreed technical solutions will be summarized and presented in the **Assessment Report**.



Task 4: Infrastructure Assessment

The Consultant shall assess the physical condition of the existing track infrastructure in the Foujdarhat - CGPY link, the CGPY terminal for new facilities, the agreed maintenance depot site, and the agreed alignment for the Bay Terminal Link. Such assessment would include (not exhaustive):

- a) a geotechnical assessment of the subgrade and surrounding areas
- b) review of drainage structures
- c) analysis of bridges and other structures
- d) assessment of track condition in the yard and port area
- e) assessment of railway access roads and connections
- f) assessment of level crossings
- g) assessment of loading and loading facilities in yard and port area
- h) assessment of the proposed CGPY yard remodeling
- i) assessment of the proposed off-dock container terminal construction at CGPY

The Consultant shall assess the physical topography between the Mirsharai Economic Zone and Logistics area and the rail facilities at the selected railway station (Barotakia, Mirsharai and Sitakunda) on the Dhaka-Chattogram railway corridor. Such assessment would include (not exhaustive):

- a) assessment of new rail link alternatives
- b) technical parameters and characteristics including operations and control of the new rail link and access to the Dhaka-Chattogram corridor
- c) planning policies
- d) land tenure/ownership
- e) a geotechnical assessment of the conditions of the subgrade and surrounding areas for the construction of the new rail link
- f) review of drainage structures
- g) analysis of bridges and other structures
- h) assessment of station buildings and local rail infrastructure
- i) assessment of railway access roads

The Consultant shall carry out a climate and disaster risk screening for project investments including review of meteorological surveys and other studies of climate risk and how they would apply to the railway investments. This screening should identify resilience measures such as improved drainage to address key risks.

The Consultant shall assess the train control systems in operation on the Foujdarhat - CGPY link and in the CGPY terminal with new facilities. The Consultant shall recommend the train



control system standard to be used in these facilities and the Bay Terminal link, considering functionality and compatibility with BR systems overall.

The Consultant shall assess the train control systems in operation on the Dhaka-Chattogram railway line in the vicinity of the Barotakia, Mirsharai and Sitakunda stations. The Consultant shall recommend the train control system standard to be used to connect the Dhaka-Chattogram railway line to Mirsharai Economic Zone and Logistics area.

The Consultant shall review the proposed investments for opportunities to green their use through wastewater treatment, ballast cleaning, use of renewable energies (rooftop solar) and other such measures.

Based on this assessment, the Consultant shall specify the proposed infrastructure investments and estimate their cost. These costs should be benchmarked against unit costs with similar projects in the East and South Asia sub-regions.

The results of this analysis will be summarized and presented in the **Assessment Report**.

Task 5: Rolling Stock Investments

The Consultant shall analyze BR's existing locomotive fleet according to gauge; power level; use (for passenger, freight, or shunting); asset age; condition and other relevant parameters. This analysis should consider issues of BR maintenance capacity and practices and life cycle issues raised in the CPCS Rolling stock Maintenance Study.

Based on this assessment and the traffic forecast carried out in Task 2, The Consultant shall analyze the need for additional meter-gauge locomotives dedicated to freight service.

The Consultant shall assess the opportunities to green BR's locomotive fleet, starting with the proposed locomotive investment, considering the following options:

- Fully battery powered
- Hybrid battery/diesel
- Efficient diesel
- Electrified with train pantograph to overhead power supply (catenary) infrastructure
- Bi-mode that can operate both under catenary and as diesel on the non-electrified network
- Tri-mode hybrid electric/diesel/battery

For the electric options, this assessment should consider the availability of electric power supply to feed the electric options and the trajectory for greening of the power supply. The cost (capital and operating expenses) and GHG saving of the options should be considered. For the efficient diesel option, considerations should be given to preserving options to convert to an electric option in the future.

The Consultant should consider alternative means of meeting the need for locomotives including, but not limited to:

- Purchase new locos
- Refurbishment of existing locos



The Consultant should present the upfront capital costs and the life cycle costs of the analyzed options, based on regional benchmarks.

Based on this assessment, The Consultant shall recommend a technical approach and cost for meeting BR's locomotive needs for the Dhaka-Chattogram freight service. This analysis will be summarized and presented in the **Assessment Report**.

Task 6: Relief Crane, Under Floor Wheel Lathe and loco shed Investments

The Consultant shall assess the the requirement of the purchasing new Relife Crane, Underfloor wheel Lathe and loco shed at CGPY. The Consultant shall carry out:

- Present scenario of Relief Crane, Under Floor Wheel Lathe and Chattogram based loco shed
- Study the accident trend and nature of the accident of Bangladesh Railway
- Assess the volume of wheel profiling need considering future growth of rolling stock
- Assess the number of Relief Crane and Under Floor Wheel Lathe that need to be procured
- Study on Chattogram based loco shed facilities and inspections and/or maintenance capacity
- Assess the requirement of loco shed at CGPY for ensuring easy access to insprction and/or maintenance of freight locomotives

Based on this assessment, The Consultant shall recommend a technical approach and cost for procuring Relief Crane and Under Floor Wheel Lathe and establishment of loco shed at CGPY for keeping fit the rolling stocks to run the Dhaka-Chattogram freight service. This analysis will be summarized and presented in the **Assessment Report**.

Task 7: Scoping of Environmental, Social and Gender Impacts

The Consultant shall undertake an assessment of the expected environmental, social and gender impacts of the proposed freight services and the defined investments, in a manner consistent with the World Bank Guidelines for Environmental and Social Framework, including its 10 Environmental and Social Standards (ESSs), as well as Bangladesh Environmental Conservation Rules (ECR) 2023, and relevant laws of Bangladesh. It shall consider all relevant direct, indirect, and cumulative environmental and social risks and impacts of the proposed project.

The Environment and Social (ES) assessment will begin by a preliminary baseline analysis, natural trend in ES ecosystem, scoping for the ES assessment followed by the assessment of the risk and impact of the project activities. The risks and impacts shall take into account:

- a) those defined by the Environmental, Health, and Safety Guidelines (EHSG)
- b) those related to community safety
- c) those related to climate change
- d) any material threat to the protection, conservation, maintenance, and restoration of natural habitats and biodiversity
- e) those related to ecosystem services and the use of living natural resources, such as fisheries and forests



- f) any prejudice or discrimination toward individuals or groups in providing access to development resources and project benefits, particularly in the case of those who may be disadvantaged or vulnerable
- g) negative economic and social impacts relating to the involuntary taking of land or restrictions on land use
- h) impacts on the health, safety, and well-being of workers and project-affected communities
- i) risks to cultural heritage

The Consultant will also consider all relevant Associated Facilities (if any) to determine the extent to which they can be brought in line with the requirements of the ESSs. The assessment should also focus on those aspects that present the most significant risks, taking into account the extent to which implementing specific measures will be technically and financially feasible.

The risk and impact analysis will lead to the development of indicative mitigation measures by the Consultant and to be implemented by the implementing authority. This will include **development of TORs** for further studies ES Management Framework (ESMF), ES Impact Assessment (ESIA), Resettlement Planning Framework/ Action Plan (RPF/RAP), Labor Management Procedure (LMP), Waste Management Plan, ES issues inclusion in Contractor Bid Document and other document necessary as per the feasibility study.

The results of this analysis will be summarized and presented in the **Assessment Report**.

Task 8: Economic Feasibility Analysis

The Consultant shall carry out an economic analysis for project investments in accordance with the World Bank economic analysis guidelines, demonstrating the economic costs and benefits to Bangladesh of the proposed investments. This would include inter alia time savings, reduced road deterioration, accident cost reductions, reduction in transport costs, maintenance costs, and reductions in other environmental and social externalities. The Consultant will estimate potential additional regional benefits of enhanced corridor efficiency into the BBIN sub-region country by country and for the regional inter-trade.

The analysis shall include:

- a) Estimation of the economic internal rate of return (EIRR) and the net present value (NPV) for all identified alternatives, compared to a defined "do-minimum" alternative using a standard benefit/cost methodology and a defined appraisal period. Costs and benefits should be expressed in constant economic prices (defined base year)
- b) All economic costs and benefits should be shadow-priced, as appropriate, to reflect local conditions, e.g. labour costs, value of freight time, vehicle costs, fuel subsidy, taxes and levies, etc. Growth in the real value of time and value of life should be included in the analysis
- c) The economic appraisal should include, where appropriate, the costs associated with any necessary expropriation of land and property



- d) Economic analysis should include the Greenhouse Gas Accounting and Shadow Price of Carbon as per the World Bank Guidance note which will be provided to the Consultant, using the WB range on price of carbon
- e) The Consultant is expected to undertake sensitivity and formal risk analyses (explaining clearly the analysis for an educated non-technical audience) on the parameters that are estimated with the greatest uncertainty, e.g. traffic and travel time forecasts, cost estimate etc. The Consultant is also expected to calculate the switching values of critical parameters²

The results of this analysis will be summarized and presented in the **Assessment Report**.

Task 9: Financial Sustainability Analysis

The Consultant shall carry out a financial analysis of the proposed investments to establish their financial sustainability. The analysis shall focus on forecasting:

- a) The revenue from freight services in the Chattogram – Dhaka corridor
- b) The revenue from services in freight terminals
- c) The costs of operation of the services
- d) The costs of maintaining the infrastructure, rolling stock and locomotives to provide the service

Should the financial analysis show that the direct revenues are not sufficient to sustain operations and maintenance of the service, the consultant should demonstrate the magnitude of the gap and potential sources of funding to fill it.

The results of this analysis will be summarized and presented in the **Assessment Report**.

Task 10 Land Acquisition Plan, Resettlement Plan, IPP

Land Acquisition Plan (LAP)

1. Land acquisition may require for Rail link to Mirsarai Economic Zone, Foujdarhat-CGPY double tracking Bay Terminal component. Consultant shall prepare LAP & other associated documents for these components.
2. Consultant shall do the following but not limited to:
 - Collect Land Acquisition Plan of existing BR land; certified latest Khatians; latest approved Mauza Map, Gazettes and other records from DC offices and consult BR's estate office records for identify the ownership of lands within the finalized Construction Right of Way (CROW). In case of anomaly DC's offices record are to be followed. Based on these documents, establish the land ownership in the finalized CROW. Within total land uses for the CROW, identify BR owned land, private land to

²Consistent with the approach outlined in Pedro Belli et al. (2001) *Economic analysis of investment operations analytical tools and practical applications*, World Bank Institute

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be newly acquired and land to be required from Government khas/other Government agencies (if any).

- Carry out 100% census and prepare detailed data base of all Project Affected People (PAPs), their affected assets, inventory of losses, identify categories for impact and eligibility of affected people for the loss of structure, trees, crops etc as per Government laws and regulations of Bangladesh related to Land Acquisition.
- Prepare district wise Land Acquisition Plan (LAP) based on latest gazette Mauza Maps with estimated cost and detailed plot schedule. The latest gazette Mauza maps are to be digitalized showing the proposed alignment including acquisition and requisition boundaries, plot number, labels of mauza, upazila and districts homesteads, angle at change of direction of alignment, and other physical features with appropriate legends for incorporation in the study report. The mauza map will constitute a basis for calculation of land acquisition and requisition areas of the affected plots at the pre-project condition. The Plot schedule will contain the following information:

Upazila:

Mauza:

JL No.:

SN	Plot No.	Khatian No.	Total Area of Plot Acre	Type of Land (as per record)	Area to be Acquired (Acre)	Full/Partial (of plot to be acquired)	Remarks
Total:							

- Prepare complete Land Acquisition Proposals for land acquisition of private land and land requisition of Government khas/other Government agencies' land. Land Acquisition Proposals are to be ready to be submitted to the approving authority as per "Acquisition and Requisition of Immovable Property Ordinance 1982" and "Immovable Property Acquisition Manual 1997" or latest manuals, laws and regulations of Bangladesh related to Land Acquisition (if required).
- Keep liaison with respective agencies for obtaining necessary clearance towards acquisition of land. Assist arranging meeting of different statutory committee as well as other committee formed by GOB from time to time in the matter of land acquisition.
- Assist Project Director in Land Acquisition process especially during feasibility of DC office, issuing of notice under section 3, Joint verification and handing over land to BR (if required).
- Perform other tasks as given from time to time by the client in the matter of Land Acquisition. Assist Project Director in Land Acquisition process specially during

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feasibility of DC office, issuing of notice under section 3 of Land Acquisition Act of GOB, Joint verification and handing over land to BR (if required).

- Perform other tasks as given from time to time by the client in the matter of Land Acquisition.

a. Resettlement Plan (RP)

3. Consultant shall do the following but not limited to:

- Based on ROW fixed by topographical survey and Land Acquisition Plan, conduct 100% census to define categories for impact and eligibility of affected people for compensation and number of titled and non-titled Entitled Persons (EPs).
- Prepare a matrix of entitlements covering compensation and other assistance for all types of impacts to fully replace lost assets, income, and livelihood in compliance with the ADB's Safeguard Policy Statement (2009) or other latest publishing.
- Carryout detailed land market survey. Assess the replacement value for lands, all types of structure, other assets, crops, and trees and discuss in detail the valuation methodology used. Identify additional top-up compensation for land, structure etc are to be paid to the Titled EPs as per replacement Value. Specific measures are to be taken for severely affected poor people, ethnic minorities, Women headed families or other vulnerable households.
- Prepare a detailed database covering EP based detailed information such as family members, their earnings & expenditure, type wise detailed inventory of assets and loss, replacement value of loss, entitlement of EP for compensations, willingness to participate in income restoration program and interested training etc. as per entitlement Matrix.
- Prepare detailed cost estimate for implementation of Resettlement Plan where cost involving Land Acquisition is to be paid by DC office; entitlement wise cost estimate for implementation of Resettlement Plan, cost estimate for implementation of Income restoration Program and cost estimate of NGOs/Agencies are to be mentioned separately.
- Prepare a Resettlement Plan (RP) based on 100% census in accordance with WB's Policy and Loan Agreement covering all of the above and acceptable to the Government and WB which covers a complete enumeration of all Project Affected People (PAPs), their affected assets etc.
- Prepare detailed resettlement implementation schedule and phasing in accordance with phasing of construction work. Prepare TOR and cost estimate for NGOs/Agencies for RP & ILRP implementation. Prepare TOR and cost estimate for External Monitoring NGOs/Agencies.

b. Indigenous People's Plan (IPP)



- Prepare an indigenous people's plan (IPP) in accordance with WB's Policy, if any indigenous people, such as tribes or settlers, as per WB's definition, are likely to be affected significantly by the project.
- Provide on the job training and knowledge transfer to the executing agency and Government personnel to implement the IPP.
- Assist the executing agency to (i) prepare an IPP implementation schedule, (ii) establish safeguard units, and (iii) recruit NGO/Agency for IPP implementation.

Task 11: Consultation with BR

Present the assessment report to BR and World Bank. Discuss technical findings and address any concerns that arise with any technical recommendations. Adapt the report as needed to address these concerns.

Task 12: Technical Specifications & Bidding Documents

In consultation with BR and World Bank about procurement packaging and procurement method, prepare technical specifications and draft bidding documents for:

- Upgrade of Foujdarhat - CGPY link line
- Upgrade of CGPY terminal
- Development of the agreed maintenance depot site and equipment
- Construction of the Bay Terminal Link
- Construction of the Rail Link from the Dhaka-Chattogram railway to the Mirsharai Economic Zone and Logistics area
- Procurement of Locomotives, Relief Crane, Under Floor Wheel Lathe and establishment of loco shed at CGPY

Task 13: Implementation Capacity

The Consultant shall assess the need for developing capacity and institutions for successful implementation of the project. This shall include:

- a) Address the need for coordination among BR, Chattogram Port Authority, the Customs Authority, and others to achieve the desired development outcomes of the project. Consultant will propose institutional options for enhancing coordination
- b) Analyze BR (agency and daughter companies) capacity gaps in project management, procurement and fiduciary, management of social and environmental safeguards, and provision of market competitive freight and logistics services. Develop a capacity building program for building skills in this area
- c) Conduct market analysis of suppliers for goods and works to be procured in the project and help BR in preparing Project Procurement Strategy for Development (PPSD) for the proposed project and a procurement plan. Assist in preparatory workshops and meetings, if required, for project preparation and discussion with stakeholders

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- d) Assist BR in preparing high value procurement Bidding Document/RFP at the beginning of the project to facilitate the project readiness, and if required, assist in the bidding process and review of bid evaluation reports in e-GP system
- e) Analyze BR's finance and accounting systems and the status of implementation of the iBAS++ computerized accounting system. Identify the scope to add modules to generate commercial business data (stock accounting, manufacturing accounting, operations etc.) in iBAS++. Analyze the options for developing business accounts, consistent with international financial reporting standards, building on iBAS++, such that BR will be able to comply with government account requirements and produce usable commercial management information from its accounting system. Develop a Terms of Reference for supporting BR to implement iBAS++ and a management accounting system
- f) Develop a digital freight program to help supporting BR in responding to client needs such as locating and tracking containers and updating on delivery time through online platforms

Task 14: Sustainability Improvement Plan

Building on the efforts in Task 4, the Consultant shall review BR's network overall for opportunities to green BR's operations, including through wastewater treatment, ballast cleaning, use of renewable energies (rooftop solar) and other such measures. Based on this review, the consultant shall prepare a sustainability improvement plan.

Deliverables

The consultant shall produce the following deliverables on the schedule shown below.

Table 1: Deliverables, Timeline and Payment Milestones

Deliverable	Time from Contract Signing	Payment Milestones
Mobilization		10%
Inception report Summarize initial findings, any changes to proposed scope, timing, or methodology of work, and Quality Management Plan.	1 month	5%
Assessment Report This report will cover the results of Tasks 1-10 and will constitute the Bankable Feasibility Plan for the proposed Investments.	5 months	45%
Technical Specifications and Bidding Documents This report will cover the results of Task 12.	7 months	20%
Implementation Capacity This report will cover the results of Task 13.	7 months	10%
Sustainability Improvement Plan This report will cover the results of Task 14.	9 months	10%

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	Deliverable	Time from Contract Signing	Payment Milestones
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100%

Administration

The contract will be administered by Bangladesh Railways. Bangladesh Railways will provide the following support to the consultant:

- Provide previous or existing studies conducted relating to the assignment
- Provide data within BR's possession and relevant policy documents
- Help with the establishment of contacts with other relevant stakeholders to facilitate the Consultant's work in undertaking the study. Assist the Consultant in working with other Government agencies that may have information that is important for the Consultant to properly undertake the assignment
- Access to project site
- Access to relevant BR staff

Consultant Qualifications

The Consultant shall be a firm with experience in the railway sector, in Bangladesh and other countries including India. The firm shall demonstrate experience in preparing feasibility studies for rail investment, rail operational analyses, use of accounting and operational IT in railways, railway capacity building programs and sustainability analysis.

The Consultant is responsible for proposing a senior and high-quality team appropriate for undertaking the assignment as envisaged in the Terms of Reference, to the required standard. It is expected that the team will include the following International and National staff, who should ideally be full-time employees of the Consultant.

(Signature)

Qualifications, Experience and Responsibilities of Consultants
CONSULTANCY SERVICES

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
A International Consultants :				
1	Team Leader (Senior) Key Expert [For SD1 & SD2]	Graduation in Civil / Railway or equivalent relevant Engineering	20 years total professional experience, preferably 12 years' experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years' experience as Project Manager/Team Leader for similar type consultancy. Working experience in FIDIC based contract and SAARC region would be preferable.	• In-charge of overall feasibility study, design tender document preparation consultancy services. Review all available reports, data and information's. • Responsibility for the successful planning, execution, monitoring, risk management, quality control, time & cost management and closure of a project. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all other experts. • Co-ordinate among experts of different discipline; Sub-consultants; Employer; related agencies & other stakeholders etc. • Recommend phasing of construction packages and finalize the phasing before Draft Final Feasibility Study Report. • Prepare Feasibility Study Report, Design Report, Bid Documents, Rolling stock Demand Analysis Report and other reports mentioned in the TOR with the assistance of his team. • Monitor the progress, prepare a standard progress report and submit it in due time. • Arrange power point/animated/multi-media presentations and meetings and response to any query raised by Project Steering Committee/ Project Implementation Committee/ Other government agencies and donor agencies etc. • Produce reports for visit of donor agency/high officials of Bangladesh and arrange field visits. • Arrange weekly progress meeting, Monthly progress meetings, and special technical meeting (if required) and issue minutes. • Arrange co-ordination meeting among experts and sub-consultants. • Discuss any matter with the Employer before finalization. Other tasks assigned by the Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
2	Architect (Senior) Key Expert [For SD1]	Graduation in Architecture	15 years total professional experience, preferably 10 years experience in Transportation field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Architect or similar post for similar type consultancy, Architectural designing at least 5 large service Building. Working experience in SAARC region and using bridge design software would be preferable.	Responsibility for Architectural designing of railway stations, including the layout of platforms, waiting areas, ticketing counters, and other facilities ensuring that the design meets functional requirements, optimizes passenger flow, and provides a comfortable and aesthetically pleasing environment. Architects shall consider the surrounding urban or natural environment when designing railway infrastructure. Create structures that harmonize with the landscape, complement existing architecture, and contribute positively to the local context. Prioritize accessibility in station design, ensuring that the facilities are easily accessible to passengers of all abilities. This includes designing accessible pathways, ramps, elevators, and signage in compliance with accessibility standards. Incorporate safety and security features into station design to protect passengers, staff, and assets. This may include designing secure entrances, implementing surveillance systems, and ensuring clear sightlines for security personnel. Responsible for the aesthetic aspects of railway infrastructure, including building facades, interior finishes, and public spaces. Integrate sustainable design principles into railway projects, considering factors such as energy efficiency, material selection, and environmental impact. Collaborate closely with engineers, planners, and other professionals to ensure that the architectural design aligns with technical requirements, operational needs, and project objectives. Ensure that their designs comply with relevant building codes, regulations, and standards governing railway infrastructure. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
3	Station Security Design Expert (Mid-Level) [For SD1]	Graduation in Security Management/ Civil Engineering/Architecture	12 years total professional experience, 10 years experience in transport sector (preferably in railway field), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Station Security Design Expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Responsible for evaluation of security risks and vulnerabilities specific to the railway station environment. Develop security design plans tailored to the station's layout and operational needs. Specify security systems and measures such as access control, surveillance, and screening checkpoints. Collaborate on contingency plans and response protocols for security incidents. Ensure security designs comply with regulations and industry standards. Collaborate with stakeholders to align security objectives with project goals. Incorporate advanced security technologies into the station design. Develop training programs to educate staff and passengers on security procedures. Monitor and evaluate security measures for ongoing effectiveness and enhancement. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
4	Urban Designer/Planner (Senior) [For SD1]	Graduation in Urban Planning or relevant subject	15 years total professional experience, preferably 10 years experience in Transportation field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Urban Planner or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Responsible for Assessing potential sites for the hub, considering accessibility, existing infrastructure, and land use patterns. Develop a comprehensive plan for the hub, integrating various transportation modes and facilities to optimize connectivity and efficiency. Design the layout and circulation patterns to facilitate seamless transfers between different modes of transportation. Prioritize accessibility features to accommodate users of all ages and abilities. Incorporate green infrastructure and sustainable transportation practices into the hub's design and operations. Engage stakeholders to gather input, address concerns, and build support for the project. Develop policies and regulations that support the development and operation of the hub. Oversee the project from planning to construction, coordinating with various stakeholders to ensure successful completion. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
5	TOD Specialist (Senior) Key Expert [For SD1]	Graduation in Urban Planning/Urban design/Transport Planning or relevant subject	12 years total professional experience, 10 years experience in transport sector (preferably in railway field), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Station Security Design Expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Responsible for Conducting site assessments to evaluate the potential for TOD around the transport hub, considering factors such as land use patterns, transportation connectivity, existing infrastructure, and market demand. Develop TOD master plans that outline the spatial layout, land use mix, building density, and design guidelines for the development of transit-oriented neighborhoods around the transport hub. Work with local authorities to establish zoning regulations, land use policies, and development incentives that support TOD principles and facilitate the implementation of TOD projects. Promote the development of mixed-use projects that combine residential, commercial, retail, and recreational amenities within walking distance of the transport hub, fostering a diverse and vibrant urban environment. Engage with stakeholders, including residents, businesses, community organizations, and government agencies, to gather input, address concerns, and build consensus around TOD projects through community meetings, workshops, and outreach activities. Coordinate with transit agencies to enhance transit service levels, improve transit access, and integrate transit facilities, such as bus stops, light rail stations, and bike-sharing stations, into the TOD area to maximize transit ridership and accessibility. Incorporate sustainable design principles, such as energy efficiency, green building practices, stormwater management, and green spaces, into TOD projects to minimize environmental impacts and enhance the quality of the built environment. Evaluate the effectiveness of TOD projects in achieving their goals, such as reducing car dependency, increasing transit ridership, promoting active transportation, and fostering economic development, through performance metrics and indicators. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
6	Railway Operation & Transport Planning Expert (Senior) (Key Expert) [For SD1 & SD2]	Graduation in relevant subject	15 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Railway Rolling Stock Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Recommend station yard layout, maintenance & operation facilities, passenger amenities, freight carrying facilities, container handling facilities etc. of the proposed components as identified during study. • Provide input during finalization of scope of work, phasing of work, preparation of study report, detailed layouts, designs, drawings, Specifications, BOQ items & quantity and tendering services. • Develop a strategy to achieve universal access to the railway system. • Assessment of present and future transport demand, de-bottling existing network, future network requirement, Options identification and Evaluation for capacity creation, Capacity building : with focus on development of the passenger and freight Transport Models • Assign tasks of all other experts. • Co-ordinate among experts of different discipline; Sub-consultants; Employer; related agencies & other stakeholders etc. • Prepare Transport Planning of existing and upcoming corridors, Analysis Report and other reports mentioned in the TOR with the assistance of his team. • Responsible for cross Border Traffic analysis, freight traffic analysis. • Responsible for collecting traffic demand analysis of other mode of transport (such as highway, waterway, airway etc) • Explore tourism opportunities through railway mode of transport. • Discuss any assumption with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
7	Structural Engineer (Senior) [For SD1 & SD2]	Graduation in Civil / Structural or equivalent relevant Engineering	15 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Railway Rolling Stock Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing all functional and residential buildings, platforms, platform sheds, foot over bridge etc. of the proposed components as identified during study. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to all functional and residential buildings, platforms, platform sheds, foot over bridge and other related structures as recommended by the consultant for different components. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts working for building related works for different components and inform the updates to Team Leader/ Deputy Team Leader. • Discuss design criteria, location of the buildings, the approaches, uses and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
8	Railway Track, Alignment and Yard Expert (Senior) (Key Expert) [For SD1 & SD2]	Graduation in Civil or equivalent relevant Engineering	15 years total professional experience, preferably 10 years' experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Alignment Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing alignment and related works of the proposed components as identified during study. • He will also be Responsible for designing the railway track of the proposed components as stipulated in the TOR. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to embankment construction and Track works. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts and subconsultants working for topographic survey & geo-technical investigation for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
9	Rolling stock Expert (Senior) (Key Expert) [For SD1 & SD2]	Graduation in Mechanical Engineering or equivalent relevant subject	15 years total professional experience, preferably 10 years' experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Railway Rolling Stock Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing rolling stock of the proposed components as stipulated in the TOR. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to workshop/depot/shed manufacturing and maintenance. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts working for bridge related works for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
10	Railway Workshop Expert (Senior) [For SD1]	Graduation in Mechanical or equivalent relevant Engineering	12 years total professional experience, preferably 10 years' experience in railway sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Locomotive Workshop Expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing locomotive workshops of the proposed components as identified during study. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to workshop/depot/shed manufacturing and maintenance. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
11	Railway Signaling & Telecommunication Expert (Mid Level) [For SD1 & SD2]	Graduation in Electrical Engineering/ communication/ IT or equivalent relevant subject	12 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Railway Signal/ Telecommunication Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing signaling of all the components, designing telecommunication, passenger information and CCTV Systems of all the components. • Responsibility for setting out phasing of work and temporary system to be adopted during conversion of meter gauge single line into dual gauge double line. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to Signal & telecom works. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts working for telecom system related works for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
12	Railway energy efficiency and climate resilience expert (Mid Level) [For SD1 & SD2]	Graduation in Environmental Engineering/Environmental Science/Civil Engineering or equivalent related field	12 years total professional experience, preferably 10 years experience in Transportation/Railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience in Railway energy and climate resilience expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Analyze and optimize energy consumption across railway operations. Develop strategies to mitigate climate change impacts on rail infrastructure. Influence policies to promote sustainable practices and resilience measures. Evaluate and implement cutting-edge technologies for energy efficiency and resilience. Collect and analyze data to inform decision-making and track progress. Collaborate with stakeholders to achieve sustainability goals. Educate railway staff on energy-efficient practices and resilience strategies. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
13	Fire Safety Expert (Mid Level) [For SD1]	Graduation in fire science, fire safety engineering, or equivalent related field	12 years total professional experience, preferably 10 years experience in Transportation field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Fire safety expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Evaluate fire risks associated with railway infrastructure, including stations, depots, and rolling stock, identifying potential hazards and vulnerabilities. Ensure adherence to relevant fire safety codes, standards, and regulations applicable to railway facilities, ensuring that designs and operations comply with legal requirements. Design fire protection systems and equipment tailored to railway environments, including detection, suppression, and evacuation systems, to mitigate fire risks and enhance safety. Develop comprehensive emergency response plans and procedures for railway facilities, outlining protocols for evacuation, firefighting, and coordination with emergency services. Provide fire safety training to railway staff, equipping them with knowledge and skills to respond effectively to fire emergencies and prevent incidents through proper protocols and procedures. Collaborate with project teams, engineers, architects, and regulatory bodies to integrate fire safety considerations into the design, construction, and operation of railway projects, ensuring that safety is prioritized at every stage. Stay abreast of advancements in fire safety technology, regulations, and best practices, continuously updating fire safety protocols and systems to reflect the latest standards and innovations. Coordinate with emergency responders and relevant authorities to facilitate swift and effective responses to fire incidents on railway premises, minimizing potential damage and ensuring the safety of passengers and personnel. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
14	Cost Estimator/Quantity Surveyor (Mid Level) [For SD1 & SD2]	Graduation in Civil or equivalent relevant Engineering	12 years total professional experience, preferably 10 years experience in Transport sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Quantity Surveyor or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for preparation of BOQ, rate analysis and Cost estimate of all the proposed components as identified during study • Preparing and Presenting Cost Estimates for Projects and Programs Financed by the WB • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts working for feasibility study, detailed design and preparation of tender documents for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss BOQ items, rates and detailed estimate with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
15	Transport Economist (Senior) [For SD1 & SD2]	Graduation in Transportation Engineering / Economics or equivalent relevant Subject	15 years total professional experience, 10 years' experience in transportation field (preferably in railway sector), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years' experience as Transport Economist or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for setting out survey questionnaire and data collection requirements to assess traffic demand as stipulated in the TOR. • Based on traffic demand prepare traffic forecast for each component following WB's 'GUIDELINES For the ECONOMIC ANALYSIS' and 'Financial Due Diligence. • Assist the Rolling stock expert to prepare Rolling Stock Demand Analysis Report. • Manage and superintend the day-to-day working of traffic survey and maximum utilization of available experts and staff. • Co-ordinate among staff/sub-consultants working for different components and inform the updates to Team Leader/ Deputy Team Leader. • Discuss any matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
16	Financial Analyst (Mid Level) [For SD1]	Graduation in Finance/Accounting/Economics or equivalent relevant Subject	12 years total professional experience, preferably 10 years' experience in Transport sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years' experience as Financial Analyst or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Develop financial plans and budgets for the project. • Estimate project costs for various phases. • Create financial models to assess project feasibility. • Identify and secure funding sources for the project. • Prepare financial reports and presentations for stakeholders. • Assess and mitigate financial risks associated with the project. • Ensure compliance with financial regulations and standards. • Forecast project revenues, expenses, and cash flows. • Analyze project financial performance and make recommendations. • Collaborate with project stakeholders on financial matters. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
17	BIM Technician (Mid Level) [For SD1]	Graduation in relevant Subject	12 years total professional experience, preferably 3 years experience in railway sector, 3 years' experience in similar type feasibility study and design consultancy, including preferably 3 years experience as BIM Technician or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Develop 3D models of railway infrastructure, including tracks, stations, bridges, tunnels, and other structures, using BIM software. Collaborate with engineers, architects, designers, and other stakeholders to coordinate the design and construction of railway infrastructure within the BIM environment, ensuring consistency and compatibility across disciplines. Perform clash detection analysis to identify and resolve conflicts between different elements of the railway infrastructure, such as clashes between tracks and structures or clashes between mechanical, electrical, and plumbing (MEP) systems. Create visualizations, renderings, and animations of the railway infrastructure to communicate design intent, facilitate stakeholder engagement, and support decision-making throughout the project lifecycle. Extract quantities and generate material takeoffs from the BIM models to support cost estimation, procurement, and construction planning for railway projects. Develop construction sequencing and phasing plans based on the BIM models to optimize construction efficiency, minimize disruptions, and ensure safety during the construction of railway infrastructure. Organize and manage BIM data, files, and documentation using BIM collaboration platforms and document management systems to ensure version control, data integrity, and accessibility for project stakeholders. Conduct quality assurance checks on BIM models to verify compliance with project requirements, standards, and specifications, and ensure the accuracy and completeness of the BIM deliverables. Provide training and technical support to project team members on BIM workflows, software applications, and best practices for effective utilization of BIM technology in railway projects. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
18	Digital Twin Technician (Mid Level) [For SD1]	Graduation in relevant Subject	12 years total professional experience, preferably 3 years experience in Transport sector, 3 years' experience in similar type feasibility study and design consultancy, including preferably 3 years experience as Digital Twin Technician or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Develop and maintain digital twin models of railway infrastructure components, such as tracks, stations, signaling systems, and rolling stock. Collect and integrate data from various sources, including sensors, IoT devices, engineering models, and operational systems, to populate the digital twin models with real-time data. Conduct simulations and analysis using the digital twin models to evaluate performance, predict outcomes, and optimize operations. Monitor the real-time performance of railway infrastructure using the digital twin models, implementing control strategies to optimize operations and improve efficiency. Implement predictive maintenance strategies using the digital twin models to anticipate equipment failures and optimize maintenance schedules. Visualize and communicate insights from the digital twin models to stakeholders, facilitating informed decision-making and collaboration. Collaborate with stakeholders across different disciplines to ensure the digital twin models align with project requirements and support project objectives. Manage the data infrastructure supporting the digital twin models, ensuring data integrity, security, and availability. Provide training and support to stakeholders on how to use and interpret the digital twin models effectively. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
19	Passenger Flow Analyst (Mid Level) [For SD1]	Graduation in Transportation Engineering/Civil Engineering or an equivalent relevant Subject	12 years total professional experience, preferably 3 years experience in railway sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Passenger Flow Analyst or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Gathering data on passenger movements within the railway system, including entry and exit points, transfer points, and travel patterns. Analyzing the collected data to identify trends, patterns, and peak travel times. This analysis helps in understanding passenger behavior and demand. Using historical data and statistical models to forecast future passenger demand. This is crucial for planning infrastructure upgrades, service changes, and resource allocation. Assessing the capacity of stations, trains, platforms, and other infrastructure elements to accommodate current and future passenger volumes. Recommending improvements or expansions as needed. Identifying opportunities to optimize passenger flow and improve operational efficiency. Using simulation software to model different scenarios and evaluate the impact of proposed changes on passenger flow. Working closely with other stakeholders such as engineers, planners, and operations managers to integrate passenger flow considerations into the overall project planning and design. Presenting findings, forecasts, and recommendations to project stakeholders in clear and concise reports. Communicating complex technical concepts effectively to non-technical audiences. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
20	E & M Expert (Mid Level) [For SD1]	Graduation in Electrical/ Electronics/ Electromechanical Engineering or relevant Subject	12 years total professional experience, preferably 8 years experience in railway sector, 5 years' experience in similar type feasibility study and design consultancy, including preferably 3 years experience as Electromechanical Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Design and develop electromechanical systems and components used in railway infrastructure, ensuring they meet project requirements and industry standards. Ensure seamless integration of electromechanical systems with other railway components, to ensure safe and efficient operation. Ensure electromechanical systems comply with safety regulations and standards, conducting risk assessments and implementing safety measures as needed. Manage electromechanical engineering aspects of the project, including planning, budgeting, and coordinating activities with other project teams. Maintain accurate documentation related to electromechanical systems, including drawings, specifications, and technical documentation. Collaborate with stakeholders, including engineers, contractors, and regulatory authorities, to address electromechanical engineering requirements and ensure project objectives are met. Identify opportunities for improvement in electromechanical systems design, operation, and maintenance, driving innovation and efficiency in railway projects. Provide training and support to project team members and end-users on electromechanical systems and equipment to ensure safe and effective operation. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
21	procurement/ Contract expert (Senior) [For SD2]	Graduation in Law or Engineering or relevant subject.	15 years total professional experience, preferably 10 years' experience in transportation field (preferably in railway sector), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Procurement/ Contract Specialist or similar post for similar type consultancy. Working experience in 10 projects to prepare FIDIC based Bid Documents for large construction funded by international donor agencies such as ADB/WB/JICA etc. Working experience in ADB funded projects and SAARC region would be preferable.	- Responsibility for preparation of bid documents incorporating all inputs from relevant experts for all construction package as decided during feasibility study and prepare evaluation criteria following WB's Guidelines as well as 'Standard Bidding Documents'. - Update the bid documents if any changes occur after approval of the project and/or during the course of time (if required). - Discuss all the contents with the Employer before finalization and inform promptly if any modification is required in the agreed bid document. - Provide assistance to PD in pre-bid clarifications, addendums, corrigendum's, evaluation of bids etc. for all the projects. - Co-ordinate among experts/staff working for different components and inform the updates to Team Leader/Deputy Team Leader, and the Employer. - Provide assistance in selection of sub-contractor under TA Consultancy, including negotiation and selection of sub-contractor. - Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
22	Track maintenance workshop expert (Mid Level) [For SD2]	Graduation in Mechanical or equivalent relevant Engineering	12 years total professional experience, preferably 10 years experience in railway sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Track Maintenance Expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing Track Maintenance workshops of the proposed components as identified during study. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to workshop/depot/shed manufacturing and maintenance. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Qualifications, Experience and Responsibilities of Consultants					Annexure - III (b)
Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities	
1	2	3	4	5	
B National Consultants :					
1	Deputy Team Leader (Senior) (Key Expert) [For SD1 & SD2]	Graduation in Civil Engineering or relevant subject	20 years total professional experience, preferably 12 years' experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years' experience as Project Manager/Team Leader or Deputy Project Manager/Deputy Team Leader for similar type consultancy. Working experience in FIDIC based contract and SAARC region would be preferable.	• Perform the acting role of 'The Engineer' during the absence of Project Team Leader. • Assist the Team Leader in conducting Feasibility study, detailed design and tendering services of all the projects as identified during study. • Assist the Team Leader to manage and superintend day-to-day working of experts/staffs and utilization of available resources with successful planning, execution, monitoring, risk management, quality control, time & cost management and closure of a project. • Co-ordinate among experts, sub-consultants and Employer and other government agencies and donor agencies. • Other tasks assigned by the Team Leader and the Employer.	
2	Architect (Senior) [For SD1 & SD2]	Graduation in Architecture or equivalent relevant subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Architect to prepare architectural plan and elevation of all the structure and landscape of all functional and residential buildings.	
3	Urban Planner (Senior) [For SD1]	Graduation in Urban Planning or relevant subject	15 years total professional experience, preferably 8 years experience in Transport field, 8 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable. e.	Assist International Urban Planner	
4	Railway Operation Expert (Senior) [For SD1 & SD2]	Graduation in relevant Subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Railway Operation Specialist	
5	Structural Engineer (Senior) [For SD1 & SD2]	Graduation in Civil or Structural Engineering or equivalent relevant subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Structural Engineer.	

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
6	Foundation/Geotechnical Engineer (Senior) [For SD1 & SD2]	Graduation in Civil / Structural or equivalent relevant Engineering	15 years total professional experience, 10 years experience in transport sector (preferably in railway field), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Foundation/Geotechnical Engineer or similar post for similar type consultancy.	• Responsibility for Foundation designing works and geotechnical data collection of the proposed components as identified during study. • Assess the soil treatment requirements, finalize location and type of soil treatment to be adopted as per geotechnical data collection of the proposed components. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to Foundation, soil treatment & other Geotechnical related works with the collaboration of Railway Bridge Engineer, Embankment Engineer and Structural Engineer. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts and sub consultants working for sub-soil investigation, other related survey/investigations and foundation & soil treatment designing works for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss design criteria, location wise soil treatment type to be adopted and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
7	Civil Engineer (Senior) [For SD1 & SD2]	Graduation in Civil / Structural or equivalent relevant Engineering	15 years total professional experience, 10 years experience in transport sector (preferably in railway field), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Foundation/Geotechnical Engineer or similar post for similar type consultancy.	Assist International Structural Engineer.
8	Earthwork Engineer (Senior) [For SD1 & SD2]	Graduation in Civil or equivalent relevant Engineering	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International 'Embankment /Earthwork Engineer'

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
9	Electrical and Airconditioning Engineer (Senior) [For SD1 & SD2]	Graduation in Electrical or equivalent relevant Engineering/subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable	• Conduct various technical survey and tests etc. • Fix the design parameters & specifications for the power supply & transmission for each component of the project • Quantify the amount of power required for the operation of the project and identify possible sources of power supply. • Planning & Design of power supply and distribution system, Ac System. • Electrical design of stations and other infrastructures. • Help Quantity Surveyor in cost estimation. • Help Procurement Expert in preparing Tender documents • Review of previous study (if any).
10	Railway Alignment, Track and Yard Expert [For SD1 & SD2]	Graduation in railway / civil or equivalent relevant Engineering	15 years total professional experience, preferably 8 years experience in railway field, 8 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable	Assist International Railway Alignment, Track and Yard Expert
11	Survey Engineer (Mid Level) [For SD1 & SD2]	Graduation in Civil / Survey or equivalent relevant Engineering	12 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable	• Conduct various topographic survey and help in identifying the alignment of proposed high speed railway. • Calculate amount of land required to be acquired and help creating all the maps including LA Map showing in the Mouza Map. • Assist 'Land Use Planner' Specialist. • Review of previous feasibility study (if any).
12	Rolling Stock Expert (Senior) [For SD1 & SD2]	Graduation in Mechanical Engineering or equivalent relevant subject	15 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Railway Rolling Stock Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Assist International Rolling Stock Expert
13	Workshop Expert (Senior) [For SD1]	Graduation in Mechanical or equivalent relevant Engineering	12 years total professional experience, preferably 10 years experience in railway sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Locomotive Workshop Expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Assist International Workshop Expert
14	Railway Signaling & Telecommunication Engineer (Senior) [For SD1 & SD2]	Graduation in Electrical/IT or equivalent relevant Engineering/subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Signaling & Telecommunication Expert.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
15	Environmental Expert (Senior) [For SD1 & SD2]	Graduation in Civil / Environmental Engineering or Environmental Management or equivalent relevant Subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	• Responsibility for carried out environmental data and sample collection and environment related survey & investigations of the proposed components as identified during study. • Prepare Environment Impact Assessment (EIA) reports based on requirements of Department of Environment (DOE) of Bangladesh Government and WB. • Identify BOQ items to be incorporated to ensure implementation of EMP and prepare detailed Specifications, estimates, rate analysis related to environment related BOQ items. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Co-ordinate among sub-consultants and staff/experts working for environment related works for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss EIA report and any other matter with the Employer before finalization. • Keep liaison with DOE, prepare environmental clearance proposal to be submitted to DOE and assist PD for getting environmental clearance from DOE. • Present the EIA report to WB, DOE or any other officials/agencies desired by the PD and response to any query related EIA. • Other task assigned by Team Leader, Deputy Team Leader and Project Director.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
16	Social Expert (Senior) [For SD1 & SD2]	Graduation in Social Science or equivalent relevant Subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	- Responsibility for carried out socio-economic survey, land market survey and other survey/data collection related to resettlement works of the proposed components as identified during study. - Prepare Resettlement Plan (RP) and socio-economic related part of the Feasibility study reports for all the components. - Prepare detailed entitlement matrix following guideline of donor agency(s). - Submit the justification of determining lump sum resettlement benefits. - Prepare gender analysis/ gender action plan / gender impact assessment following WB's Guidelines - Prepare an indigenous people's plan (IPP) in accordance with WB's policy - Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff - Co-ordinate among staff/experts working and sub-consultants assigned for Topographic survey and socio economic survey & land market survey for different components - Discuss entitlement matrix, TOR & estimate of INGO and any other matter with the Employer before finalization. - Present the RP report to WB, DOE or any other officials/agencies desired by the PD and response to any query related RP. - Carryout discussion meetings with APs, focus group discussion etc. to explain the impact of the project and entitlement of EPs. - Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
17	Transport Economist (Senior) [For SD1 & SD2]	Graduation in Transportation Engineering / Economics or equivalent relevant Subject	15 years total professional experience, preferably 8 years experience in railway field, 8 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Transport Economist
18	Procurement/Contract Specialist (Senior) [For SD1 & SD2]	Graduation in Law or Engineering or relevant subject.	15 years total professional experience, 8 years experience of similar type of project, 8 years' experience of working as Procurement / Contract Specialist or similar post. Working experience in 10 projects to prepare FIDIC based Bid Documents for large construction funded by international donor agencies such as ADDWBJICA etc. Working experience in international donor agency funded project would be preferable.	Assist International Procurement / Contract Specialist.
19	Financial Analyst (Senior) [For SD1]	Graduation in Finance/Accounting/Economics or equivalent relevant Subject	12 years total professional experience, preferably 10 years experience in railway sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Financial Analyst or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Assist International Financial Specialist.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
20	Bridge Design Engineer (Senior) [For SD2]	Graduation in Civil / Structural or equivalent relevant Engineering	15 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Bridge Designer or similar post for similar type consultancy, designing at least 15 major bridges in deep water. Working experience in SAARC region and using bridge design software would be preferable.	• Responsibility for designing bridge/culverts/viaducts/road over bridges of the proposed components as stipulated in the TOR. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to Bridge construction. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts working for bridge related works for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
21	Land Acquisition and Resettlement Specialist (Senior) [For SD1 & SD2]	Graduation in Social Science or equivalent relevant Subject	12 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	• Prepare Land Acquisition Plan • Collect all Land related document from DC Office and other related offices. Coordinate with Social Expert. • Prepare Cost Estimate for Land Acquisition and Resettlement • Review of previous study (if any). • Other task assigned by Team Leader, Deputy Team Leader and Project Director.
22	Track Maintenance Expert (Senior) [For SD2]	Graduation in railway / civil or equivalent relevant Engineering	15 years total professional experience, preferably 8 years experience in railway field, 8 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Track Maintenance Workshop Expert
23	Cost Estimator (Senior) [For SD2]	Graduation in civil or equivalent relevant Engineering	15 years total professional experience, preferably 8 years experience in railway field, 8 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Cost Estimator/Quantity Surveyor

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