

**ISLAMIC REPUBLIC OF PAKISTAN
MINISTRY OF RAILWAYS
PAKISTAN RAILWAYS**



ASIAN DEVELOPMENT BANK

**ADB LOAN 6056-PAK(COL):
RAILWAY IMPROVEMENT PROJECT –
PROJECT READINESS FINANCING**

**CONTRACT FOR
CONSULTANT' SERVICES**

(Lump Sum)

**PR/QCBS/CONS-01: CONSULTANCY
SERVICES FOR DESIGN REVIEW,
INSTITUTIONAL STRENGTHENING, AND PPP /
COMMERCIALIZATION FOR THE ML-1
(KARACHI – ROHRI) (480 KM) UPGRADATION
PROJECT
[SELECTION 218892]**

**Project Implementation Unit
Main Line-1 (ML-1), Pakistan Railways
Railway Improvement Project
Government of Pakistan
Lahore**

**Address: 3 Mayo Gardens, Sunderdas Road Lahore, Punjab Pakistan
Contact: +92-42-99202372, E-mail: pdpiu@pakrail.gov.pk**

**PR/QCBS/CONS-01: CONSULTANCY SERVICES FOR DESIGN REVIEW,
INSTITUTIONAL STRENGTHENING, AND PPP / COMMERCIALIZATION FOR THE
ML-1 KARACHI – ROHRI (480 KM) UPGRADATION PROJECT [SELECTION 218892]**

(1)

**HARMONIZED STANDARD FORM OF
CONTRACT**

**Consultant's
Services**

Lump Sum



Lump Sum	3
I. Form of Contract.....	9
II. General Conditions of Contract.....	11
A. GENERAL PROVISIONS	11
2. Relationship between the Parties.....	12
3. Law Governing Contract	12
4. Language	12
5. Headings.....	12
6. Communications	12
7. Location	13
8. Authority of Member in Charge	13
9. Authorized Representatives	13
10. Corrupt and Fraudulent Practices	13
B. COMMENCEMENT, COMPLETION, MODIFICATION AND TERMINATION OF CONTRACT ...	13
11. Effectiveness of Contract	13
12. Termination of Contract for Failure to Become Effective.....	13
13. Commencement of Services	14
14. Expiration of Contract.....	14
15. Entire Agreement	14
16. Modifications or Variations	14
17. Force Majeure.....	14
18. Suspension	15
19. Termination	16
C. OBLIGATIONS OF THE CONSULTANT	17
20. General	17
21. Conflict of Interests	18
22. Confidentiality.....	19
23. Liability of the Consultant.....	19
24. Insurance to be Taken out by the Consultant.....	19
25. Accounting, Inspection and Auditing	20
26. Reporting Obligations.....	20
27. Proprietary Rights of the Client in Reports and Records.....	20

28.	Equipment, Vehicles and Materials	21
D.	CONSULTANT'S EXPERTS AND SUB-CONSULTANTS	21
29.	Description and Obligations of Key Experts	21
30.	Replacement of Key Experts	22
31.	Removal of Experts or Sub-Consultants	22
E.	OBLIGATIONS OF THE CLIENT	22
32.	Assistance and Exemptions	22
33.	Access to Project Site	23
34.	Change in the Applicable Law Related to Taxes and Duties	23
35.	Services, Facilities and Property of the Client	23
36.	Counterpart Personnel	23
37.	Payment Obligation	24
F.	PAYMENTS TO THE CONSULTANT	24
38.	Contract Price	24
39.	Taxes and Duties	24
40.	Currency of Payment.....	24
41.	Mode of Billing and Payment.....	24
42.	Interest on Delayed Payments	25
G.	FAIRNESS AND GOOD FAITH	25
43.	Good Faith	25
H.	SETTLEMENT OF DISPUTES	25
44.	Amicable Settlement	25
45.	Dispute Resolution	26
I.	ELIGIBILITY	26
46.	Eligibility	26
Attachment 1: Bank's Anticorruption Policy		27
III.	Special Conditions of Contract.....	31
IV.	Appendices.....	41
	Appendix A: Terms of Reference	41
A.	PROJECT BACKGROUND.....	44
B.	PURPOSE OF THE ASSIGNMENT	44
C.	DURATION AND LOCATION OF THE SERVICES	45



D.	OUTLINE SCOPE OF THE CONSULTING SERVICES	46
E.	DETAILED SCOPE OF CONSULTING SERVICES.....	47
	Output 1: Design Review, Vetting & Value Engineering.....	47
	E.1 Review of Existing Data	47
	E.2 Engineering Surveys and Investigations Verification	48
	E.3 Safeguards' Reviews and Compliance Verification/Gender mainstreaming.....	50
	E.4 Scope of Engineering Design Review and Value Engineering:.....	59
	E.5 Economic and Financial Analyses	80
	E.6 Financial Management Assessment.....	80
	E.7 Strategic Procurement Plan.....	81
	E.8 Procurement Support.....	82
	OUTPUT 2: INSTITUTIONAL REFORM & CAPACITY BUILDING.....	83
	E.9 Institutional and Organizational Reform.....	83
	E.10 Capacity Building and Training.....	88
	Output 3: Enhanced Financial Performance and Commercial Optimization	90
	E.11 Financial Performance and Commercial Optimization-Output.....	90
	E.12 Assessment of Carbon Marke Opportunities	93
	E.13 Port–Rail Intermodal Connectivity and Integration with ML-1	96
F.	REPORTS AND DELIVERABLES	98
G.	TEAM COMPOSITION AND QUALIFICATION REQUIREMENTS	108
	G.1 Consultant team requirements	108
	G.2 Key Expert Requirements:.....	109
	G.3 Non-Key Expert Requirements.....	121
	Qualification:	141
	Experience:	142
H.	CLIENT'S INPUT AND COUNTERPART PERSONNEL.....	152
I.	BASIS OF PAYMENT	153
J.	SUPPLEMENTARY INFORMATION	154
K.	Implementation Arrangements	155
L.	Data, Services and Facilities to be Provided by the Client	155
M.	Facilities To Be Provided by The Client	155

N. Facilities To Be Arranged By The Consultant.....	155
Appendix B: Key Experts	161
Appendix C: Breakdown of Contract Price.....	162
Appendix C: Breakdown of Contract Price.....	170
Appendix D: Form of Advance Payments Guarantee	173
Appendix E: minutes of contract negotiations	175



CONTRACT FOR CONSULTANT'S SERVICES

Lump Sum

Project Name: Railway Improvement Project – Project Readiness Financing

Loan No. ADB Loan 6056-PAK(COL)

Contract No. PR/QCBS/CONS-01

Between

**Ministry of Railways, Government of Pakistan
through**

**Project Director, Project Implementation Unit, Main Line-1 (ML-1), Pakistan
Railways, Railway Improvement Project, Government of Pakistan**

[Name of the Client]

and

**M/s DOHWA Engineering Co., Ltd. Republic of Korea (Lead JV Partner)
In Association with M/s National Engineering Corporation, Pakistan (Sub-
consultant)**

[Name of the Consultant]

Dated: 05 June 2026



**E-STAMP
(GOVERNMENT OF PUNJAB)**



PB-LHR-30C38AC0B127A2E4

PSID-40172606050117710

Rs 10,000/-

Ten Thousand Rupees Only

Deed Name : AGREEMENT OR MEMORANDUM OF AN AGREEMENT - 5(ccc)
First Party : Dohwa Engineering Co Ltd [5440063347999]
Second Party : Ministry Of Railway Govt Of Pakistan [611019020267]
Recipient : Muhammad Rafaqat [35202-4387184-5]
Issue Date : 05-Jun-2026, 11:56:12 AM
Stamp Duty Paid by : Ministry Of Railway Govt Of Pakistan [6110190202677]
Paid Through Challan : 20262493E1B9D9AC

Please Write Below This Line

**I. Form of Contract
LUMP SUM**

This CONTRACT for PR/QCBS/CONS-01: Consultancy Services for Design Review, Institutional Strengthening, and PPP / Commercialization for the ML-1 Karachi – Rohri (480 Km) Upgradation Project [Selection 218892] (hereinafter called the "Contract") is made the 05th day of the month of June, 2026, between, on the one hand, Ministry of Railways, Government of Pakistan, through Project Director, Project Implementation Unit, Main Line-1 (ML-1), Pakistan Railways, Railway Improvement Project, Government of Pakistan (hereinafter called the "Client") and, on the other hand, M/s Dohwa Engineering Co., Ltd. – [Republic of Korea] with its legal address as 438, Samseong-ro, Gangnam-gu, Seoul 06178, Korea in association with M/s National Engineering Corporation, Pakistan (Sub-consultant) (hereinafter called the "Consultant").

WHEREAS

- (a) the Client has requested the Consultant to provide certain consulting services as defined in this Contract (hereinafter called the "Services").
- (b) the Consultant, having represented to the Client that it has the required professional skills, expertise and technical resources, has agreed to provide the Services on the terms and conditions set forth in this Contract; and
- (c) the Client has received a loan from the Asian Development Bank: toward the cost of the Services and intends to apply a portion of the proceeds of this loan to eligible payments under this Contract, it being understood that (i) payments by the Bank will be made only at the request of the Client and upon approval by the Bank; (ii) these payments will be subject, in all respects, to the terms and conditions of the loan agreement, including prohibitions of withdrawal from the loan account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Bank, is prohibited by the decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations; and (iii) no party other than the Client shall derive any rights from the loan agreement or have any claim to the loan proceeds.

NOW THEREFORE the parties hereto hereby agree as follows:

1. The following documents attached hereto shall be deemed to form an integral part of this Contract:
 - (a) The General Conditions of Contract (including Attachment 1: Anticorruption Policy).
 - (b) The Special Conditions of Contract.
 - (c) Appendices:
 - Appendix A: Terms of Reference
 - Appendix B: Key Experts
 - Appendix C: Breakdown of Contract Price
 - Appendix D: Form of Advance Payments Guarantee
 - Appendix E: Minutes of Contract Negotiations

If there is any inconsistency between the documents, the following order of precedence shall prevail: Appendix E: Minutes of Contract Negotiations; the Special Conditions of Contract; the General Conditions of Contract, including Attachment 1;




CMS/PS

Appendix A; Appendix B; Appendix C; Appendix D. Any reference to this Contract shall include, where the context permits, a reference to its Appendices.

2. The mutual rights and obligations of the Client and the Consultant shall be as set forth in the Contract, in particular:
- the Consultant shall carry out the Services in accordance with the provisions of the Contract; and
 - the Client shall make payments to the Consultant in accordance with the provisions of the Contract.

IN WITNESS WHEREOF, the Parties hereto have caused this Contract to be signed in their respective names on the day, and year first above written.

For and on behalf of Ministry of Railways, Government of Pakistan



(Muhammad Amjad Iqbal)
Project Director
Project Implementation Unit
Main Line-1 (ML-1), Pakistan Railways
Railway Improvement Project
Government of Pakistan
Lahore



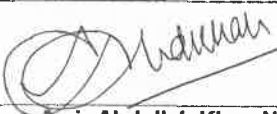
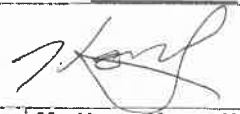
Address: 3 Mayo Gardens, Sunderdas Road Lahore, Punjab Pakistan

For and on behalf of M/s Dohwa Engineering Co., Ltd. – [Republic of Korea]



Mr. Kim Changpil
Authorized Representative
Vice President, 1st Railway Department
M/s Dohwa Engineering Co., Ltd. [Republic of Korea]



Witness No. 1		Witness No. 2	
			
Name:	Engr. Amir Abdullah Khan Niazi	Name:	Mr. Hong, Kyung Wún
	Contract Management Specialist/ Procurement Specialist PIU, ML-1, Pakistan Railways		Principal Engineer M/s DOHWA Engineering Co., Ltd. Republic of Korea
CNIC No.	61101-9020267-7	Passport	M23130922

PR/QCBS/CONS-01: Consultancy Services for Design Review, Institutional Strengthening, and PPP / Commercialization for the ML-1 Karachi - Rohri (480 Km) Upgradation Project [Selection 218892]
[Contract for Consultant's Services – Page 10 of 175]



II. General Conditions of Contract

A. GENERAL PROVISIONS

1. Definitions	<p>(a) Unless the context otherwise requires, the following terms whenever used in this Contract have the following meanings:</p> <p>(b) "Applicable Guidelines" are guidelines or policies of the Asian Development Bank governing the selection and Contract award process as specified in the Special Conditions of Contract (SCC).</p> <p>(c) "Applicable Law" are the laws and any other instruments having the force of law in the Client's country, or in such other country as may be specified in the (SCC), as they may be issued and in force from time to time.</p> <p>(d) "Bank" refers to the Asian Development Bank.</p> <p>(e) "Borrower [<i>or Recipient or Beneficiary</i>]" refers to the Government, Government agency or other entity that signs the financing [<i>or loan or grant or project</i>] agreement with the Bank.</p> <p>(f) "Client" refers to the [<i>implementing or the executing</i>] agency that signs the Contract for the Services with the Selected Consultant.</p> <p>(g) A "Consultant" is a legally-established professional consulting firm or entity selected by the Client to provide the Services under the signed Contract.</p> <p>(h) A "Contract" is the legally binding signed written agreement between the Client and the Consultant and which includes all the attached documents listed in its paragraph 1 of the Form of Contract (the General Conditions [GCC], SCC, and the Appendices).</p> <p>(i) A "Day" is a working day unless indicated otherwise.</p> <p>(j) "Effective Date" refers to the date on which this Contract comes into force and effect pursuant to Clause GCC 11.</p> <p>(k) "Experts" are, collectively, Key Experts, Non-Key Experts, or any other personnel of the Consultant, Sub-Consultant or Joint Venture (JV) member(s) assigned by the Consultant to perform the Services or any part thereof under the Contract.</p> <p>(l) "Foreign Currency" is any currency other than the currency of the Client's country.</p> <p>(m) "GCC" refers to these General Conditions of Contract.</p> <p>(n) "Government" refers to the government of the Client's country.</p> <p>(o) "Joint Venture (JV)" is an association with or without a legal personality distinct from that of its members, of more than one entity where one member has the authority to conduct all businesses for and on behalf of any and all the members of the</p>
-----------------------	--

	<p>JV, and where the members of the JV are jointly and severally liable to the Client for the performance of the Contract.</p> <p>(p) "Key Expert" refers to an individual professional whose skills, qualifications, knowledge and experience are critical to the performance of the Services under the Contract and whose Curriculum Vitae (CV) was taken into account in the technical evaluation of the Consultant's proposal.</p> <p>(q) "Local Currency" is the currency of the Client's country.</p> <p>(r) "Non-Key Expert(s)" is an individual professional provided by the Consultant or its Sub-Consultant to perform the Services or any part thereof under the Contract.</p> <p>(s) "Party" refers to the Client or the Consultant, as the case may be, and "Parties" means both of them.</p> <p>(t) The "Special Conditions of Contract (SCC)" can amend or supplement but not overwrite the GCC.</p> <p>(u) "Services" refers to the work to be performed by the Consultant pursuant to this Contract, as described in Appendix A hereto.</p> <p>(v) "Sub-consultant" is an entity to whom/which the Consultant subcontracts any part of the Services while remaining solely liable for the execution of the Contract.</p> <p>(w) "Third Party" means any person or entity other than the Government, the Client, the Consultant or a Sub-Consultant.</p>
2. Relationship between the Parties	2.1. Nothing contained herein shall be construed as establishing a relationship of master and servant or of principal and agent as between the Client and the Consultant. The Consultant, subject to this Contract, has complete charge of the Experts and Sub-Consultants, if any, performing the Services and shall be fully responsible for the Services performed by them or on their behalf hereunder.
3. Law Governing Contract	3.1. This Contract, its meaning and interpretation, and the relation between the Parties shall be governed by the Applicable Law as specified in the SCC .
4. Language	4.1. This Contract has been executed in the language specified in the SCC , which shall be the binding and controlling language for all matters relating to the meaning or interpretation of this Contract.
5. Headings	5.1. The headings shall not limit, alter or affect the meaning of this Contract.
6. Communications	6.1. Any communication required or permitted to be given or made pursuant to this Contract shall be in writing in the language specified in Clause GCC 4. Any such notice, request or consent shall be deemed to have been given or made when delivered in person to an authorized representative of the Party to whom communication is

	<p>addressed, or when sent to such Party at the address specified in the SCC.</p> <p>6.2. A Party may change its address for notice hereunder by giving the other Party any communication of such change to the address specified in the SCC.</p>
7. Location	7.1. The Services shall be performed at such locations as are specified in Appendix A hereto and, where the location of a particular task is not so specified, at such locations, whether in the Government's country or elsewhere, as the Client may approve.
8. Authority of Member in Charge	8.1. In case the Consultant is a JV, the members hereby authorize the member specified in the SCC to act on their behalf in exercising all the Consultant's rights and obligations towards the Client under this Contract, including without limitation the receiving of instructions and payments from the Client.
9. Authorized Representatives	9.1. Any action required or permitted to be taken, and any document required or permitted to be executed under this Contract by the Client or the Consultant may be taken or executed by the officials specified in the SCC .
10. Corrupt and Fraudulent Practices	10.1. The Bank requires compliance with its Anticorruption Policy as set forth in Attachment 1 to the GCC.
Commissions and Fees	10.2. The Client requires the Consultant to disclose any commissions, gratuities, or fees that may have been paid or are to be paid to agents or any other party with respect to the selection process or execution of the Contract. The information disclosed must include at least the name and address of the agent or other party, the amount and currency, and the purpose of the commission, gratuity or fee. Failure to disclose such commissions, gratuities or fees may result in the termination of the Contract and/or remedial actions including sanctions by the Bank.

B. COMMENCEMENT, COMPLETION, MODIFICATION AND TERMINATION OF CONTRACT

11. Effectiveness of Contract	11.1. This Contract shall come into force and effect on the date (the "Effective Date") of the Client's notice to the Consultant instructing the Consultant to begin carrying out the Services. This notice shall confirm that the effectiveness conditions, if any, listed in the SCC have been met.
12. Termination of Contract for Failure to Become Effective	<p>12.1. If this Contract has not become effective within such time period after the date of Contract signature as specified in the SCC, either Party may, by not less than 22 day</p> <p>12.2. s written notice to the other Party, declare this Contract to be</p>



	<p>null and void, and in the event of such a declaration by either Party, neither Party shall have any claim against the other Party with respect hereto.</p>
13. Commencement of Services	<p>13.1. The Consultant shall confirm the availability of Key Experts and begin carrying out the Services not later than the number of days after the Effective Date specified in the SCC.</p>
14. Expiration of Contract	<p>14.1. Unless terminated earlier pursuant to Clause GCC 19 hereof, this Contract shall expire at the end of such time period after the Effective Date as specified in the SCC.</p>
15. Entire Agreement	<p>15.1. This Contract contains all covenants, stipulations and provisions agreed by the Parties. No agent or representative of either Party has authority to make, and the Parties shall not be bound by or be liable for, any statement, representation, promise, or agreement not set forth herein.</p>
16. Modifications or Variations	<p>16.1. Any modification or variation of the terms and conditions of this Contract, including any modification or variation of the scope of the Services, may only be made by written agreement between the Parties. However, each Party shall give due consideration to any proposals for modification or variation made by the other Party.</p> <p>16.2. In cases of substantial modifications or variations, the prior written consent of the Bank is required.</p>
17. Force Majeure	
a. Definition	<p>17.1. For the purposes of this Contract, "Force Majeure" means an event beyond the reasonable control of a Party, is not foreseeable, is unavoidable, and makes a Party's performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible under the circumstances, and subject to those requirements. Examples include, but are not limited to, war, riots, civil disorder, earthquake, fire, explosion, storm, flood or other adverse weather conditions, strikes and lockouts or other industrial action confiscation or any other action by Government agencies.</p> <p>17.2. Force Majeure shall not include (i) any event caused by the negligence or intentional action of a Party or such Party's Experts, Sub-Consultants or agents or employees, nor (ii) any event a diligent Party could reasonably have been expected to both take into account at the time of the conclusion of this Contract, and avoid or overcome in the carrying out of its obligations hereunder.</p> <p>17.3. Force Majeure shall not include insufficiency of funds or failure to make any payment required hereunder.</p>

<p>b. No Breach of Contract</p>	<p>17.4. The failure of a Party to fulfill any of its obligations hereunder shall not be considered to be a breach of, or default under, this Contract insofar as such inability arises from an event of Force Majeure, provided that the Party affected by such an event has taken all reasonable precautions, due care and reasonable alternative measures, all with the objective of carrying out the terms and conditions of this Contract.</p>
<p>c. Measures to be Taken</p>	<p>17.5. A Party affected by an event of Force Majeure shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall take all reasonable measures to minimize the consequences of any event of Force Majeure.</p> <p>17.6. A Party affected by an event of Force Majeure shall notify the other Party as soon as possible, and in any case not later than 14 calendar days following its occurrence, providing evidence of the nature and cause of the event, and shall similarly give written notice of the restoration of normal conditions as soon as possible.</p> <p>17.7. Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which the Party was unable to perform the action as a result of Force Majeure.</p> <p>17.8. During the period of their inability to perform the Services as a result of an event of Force Majeure, the Consultant, upon instructions by the Client, shall either:</p> <ul style="list-style-type: none"> (a) demobilize, in which case the Consultant shall be reimbursed for additional costs they reasonably and necessarily incurred, and, if required by the Client, in reactivating the Services; or (b) continue with the Services to the extent reasonably possible, in which case the Consultant shall continue to be paid under the terms of this Contract and be reimbursed for additional costs reasonably and necessarily incurred. <p>17.9. In the case of disagreement between the Parties as to the existence or extent of Force Majeure, the matter shall be settled according to Clauses GCC 44 and 45.</p>
<p>18. Suspension</p>	<p>18.1. The Client may, by written notice of suspension to the Consultant, suspend all payments to the Consultant hereunder if the Consultant fails to perform any of its obligations under this Contract, including the carrying out of the Services, provided that the notice of suspension (i) shall specify the nature of the failure, and (ii) shall request the Consultant to remedy the failure within a period not exceeding 30 calendar days after receipt by the Consultant of the notice of suspension.</p>

19. Termination	19.1. This Contract may be terminated by either Party as per provisions set up below:
a. By the Client	<p>19.1.1. The Client may terminate this Contract in case of the occurrence of any of the events specified in paragraphs (a) through (f) of this Clause occurs. In this case, the Client shall give at least 30 calendar days' written notice of termination to the Consultant for the events referred to in (a) to (d); at least 60 calendar days' written notice in case for the event referred to in (e); and at least five (5) calendar days' written notice for the event referred to in (f):</p> <ul style="list-style-type: none"> (a) If the Consultant fails to remedy a failure in the performance of its obligations hereunder, as specified in a notice of suspension pursuant to Clause GCC 18; (b) If the Consultant (or, if the Consultant consists of more than one entity, if any of its members) becomes insolvent or bankrupt or enter into any agreements with their creditors for relief of debt or take advantage of any law for the benefit of debtors or go into liquidation or receivership whether compulsory or voluntary; (c) If the Consultant fails to comply with any final decision reached as a result of arbitration proceedings pursuant to Clause GCC 45.1; (d) If, as the result of Force Majeure, the Consultant is unable to perform a material portion of the Services for a period of not less than 60 calendar days; (e) If the Client, in its sole discretion and for any reason whatsoever, decides to terminate this Contract; or (f) If the Consultant fails to confirm the availability of Key Experts as required in Clause GCC 13. <p>19.1.2. Furthermore, if the Client determines that the Consultant has engaged in corrupt, fraudulent, collusive, coercive <i>[or obstructive]</i> practices or other integrity violations, in competing for or in executing the Contract, the Client may, after giving 14 calendar days' written notice to the Consultant, terminate the Consultant's employment under the Contract.</p>
b. By the Consultant	<p>19.1.3. The Consultant may terminate this Contract, by not less than thirty (30) calendar days' written notice to the Client, in case of the occurrence of any of the events specified in paragraphs (a) to (d) of this Clause occurs.</p> <ul style="list-style-type: none"> (a) If the Client fails to pay any money due to the Consultant pursuant to this Contract and not subject to dispute pursuant to Clause GCC 45.1 within 45 calendar days after receiving a written notice from the Consultant that the payment is overdue;



	<p>(b) If, as the result of Force Majeure, the Consultant is unable to perform a material portion of the Services for a period of not less than 60 calendar days;</p> <p>(c) If the Client fails to comply with any final decision reached as a result of arbitration pursuant to Clause GCC 45.1; or</p> <p>(d) If the Client is in material breach of its obligations pursuant to this Contract and has not remedied the same within 45 days (or a longer period that the Consultant may have subsequently approved in writing) following the receipt by the Client of the Consultant's notice specifying the breach.</p>
c. Cessation of Rights and Obligations	<p>19.1.4. Upon termination of this Contract pursuant to Clauses GCC 12 or GCC 19 hereof, or upon expiration of this Contract pursuant to Clause GCC 14, all rights and obligations of the Parties hereunder shall cease, except (i) such rights and obligations as may have accrued on the date of termination or expiration, (ii) the obligation of confidentiality set forth in Clause GCC 22, (iii) the Consultant's obligation to permit inspection, copying and auditing of their accounts and records set forth in Clause GCC 25, and (iv) any right a Party may have under the Applicable Law.</p>
d. Cessation of Services	<p>19.1.5. Upon termination of this Contract by notice of either Party to the other pursuant to Clauses GCC 19a or GCC 19b, the Consultant shall, immediately upon dispatch or receipt of the notice, take all necessary steps to bring the Services to a close in a prompt and orderly manner and shall make every reasonable effort to keep expenditures for this purpose to a minimum. With respect to documents prepared by the Consultant, the Consultant shall proceed as provided by Clause GCC 27. For equipment and materials furnished by the Client, the Consultant shall refer to GCC 28.</p>
e. Payment upon Termination	<p>19.1.6. Upon termination of this Contract, the Client shall pay the Consultant the following:</p> <p>(a) payment for Services satisfactorily performed prior to the effective date of termination; and</p> <p>(b) in the case of termination pursuant to paragraphs (d) and (e) of Clause GCC 19.1.1, reimbursement of any reasonable cost incidental to the prompt and orderly termination of this Contract, including the cost of the return travel of the Experts.</p>

C. OBLIGATIONS OF THE CONSULTANT

20. General	
a. Standard of	20.1 The Consultant shall perform the Services and carry out the

PR/QCBS/CONS-01: Consultancy Services for Design Review, Institutional Strengthening, and PPP / Commercialization for the ML-1 Karachi - Rohri (480 Km) Upgradation Project [Selection 218892]
[Contract for Consultant's Services - Page 17 of 175]

Performance	<p>Services with all due diligence, efficiency and economy, in accordance with generally accepted professional standards and practices, and shall observe sound management practices, and employ appropriate technology and safe and effective equipment, machinery, materials and methods. The Consultant shall always act, in respect of any matter relating to this Contract or to the Services, as a faithful adviser to the Client, and shall at all times support and safeguard the Client's legitimate interests in any dealings with the third parties.</p> <p>20.2. The Consultant shall employ and provide such qualified and experienced Experts and Sub-Consultants as are required to carry out the Services.</p> <p>20.3. The Consultant may subcontract part of the Services to an extent and with such Key Experts and Sub-Consultants as may be approved in advance by the Client. Notwithstanding this approval, the Consultant shall retain full responsibility for the Services.</p>
b. Law Applicable to Services	<p>20.4. The Consultant shall perform the Services in accordance with the Contract and the Applicable Law and shall take all practicable steps to ensure that any of its Experts and Sub-Consultants, comply with the Applicable Law.</p> <p>20.5. Throughout the execution of the Contract, the Consultant shall comply with the import of goods and services prohibitions in the Client's country when</p> <ul style="list-style-type: none"> (a) as a matter of law or official regulations, [the Borrower's/Beneficiary's] country prohibits commercial relations with that country; or (b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's Country prohibits any import of goods from that country or any payments to any country, person, or entity in that country. <p>20.6. The Client shall notify the Consultant in writing of relevant local customs, and the Consultant shall, after being notified, respect these customs.</p>
21. Conflict of Interests	<p>21.1. The Consultant shall hold the Client's interests paramount, without any consideration for future work, and strictly avoid conflict with other assignments or their own corporate interests.</p>
Consultant Not to Benefit from Commissions, Discounts, etc.	<p>21.1.1 The payment of the Consultant pursuant to GCC F (Clauses GCC 38 to GCC 42) shall constitute the Consultant's only payment in connection with this Contract and, subject to Clause GCC 21.1.3, the Consultant shall not accept for its own benefit any trade commission, discount or similar payment in connection with activities pursuant to this Contract or in the discharge of its obligations hereunder, and the Consultant shall use its best efforts to ensure that any Sub-Consultants, as well</p>

	<p>as the Experts and agents of either of them, similarly shall not receive any additional payment.</p> <p>21.1.2 If the Consultant, as part of the Services, has the responsibility of advising the Client on the procurement of goods, works, or services, the Consultant shall comply with the Bank's Applicable Guidelines, and shall at all times exercise this responsibility in the best interests of the Client. Any discounts or commissions obtained by the Consultant in procuring goods, works, or services shall be for the account of the Client.</p>
Consultant and Affiliates Not to Engage in Certain Activities	<p>21.1.3 The Consultant agrees that, during the term of this Contract and after its termination, the Consultant and any entity affiliated with the Consultant, as well as any Sub-Consultants and any entity affiliated with such Sub-Consultants, shall be disqualified from providing goods, works or non-consulting services resulting from or directly related to the Consultant's Services for the preparation or implementation of the project, unless otherwise indicated in the SCC.</p>
Prohibition of Conflicting Activities	<p>21.1.4 The Consultant shall not engage, and shall cause its Experts as well as its Sub-Consultants not to engage, either directly or indirectly, in any business or professional activities that would conflict with the activities assigned to them under this Contract.</p>
Strict Duty to Disclose Conflicting Activities	<p>21.1.5 The Consultant has an obligation and shall ensure that its Experts and Sub-Consultants shall have an obligation to disclose any situation of actual or potential conflict that impacts their capacity to serve the best interests of their Client, or that may reasonably be perceived as having this effect. Failure to disclose these situations may lead to the disqualification of the Consultant or the termination of its Contract.</p>
22. Confidentiality	<p>22.1 Except with the prior written consent of the Client, the Consultant and the Experts shall not at any time communicate to any person or entity any confidential information acquired in the course of the Services, nor shall the Consultant and the Experts make public the recommendations formulated in the course of, or as a result of, the Services public.</p>
23. Liability of the Consultant	<p>23.1 Subject to additional provisions, if any, set forth in the SCC, the Consultant's liability under this Contract shall be as determined under the Applicable Law.</p>
24. Insurance to be Taken out by the Consultant	<p>24.1 The Consultant (i) shall take out and maintain, and shall cause any Sub-Consultants to take out and maintain, at its (or the Sub-Consultants', as the case may be) own cost but on terms and conditions approved by the Client, insurance against the risks, and</p>

	for the coverage specified in the SCC , and (ii) at the Client's request, shall provide evidence to the Client showing that the insurance has been taken out and maintained and that the current premiums have been paid. The Consultant shall ensure that the insurance is in place prior to commencing the Services as stated in Clause GCC 13.
25. Accounting, Inspection and Auditing	<p>25.1 The Consultant shall keep, and shall make all reasonable efforts to cause its Sub-Consultants to keep, accurate and systematic accounts and records in respect of the Services and in such form and detail as will clearly identify relevant time changes and costs.</p> <p>25.2 The Consultant shall permit and shall cause its Sub-Consultants to permit, the Bank and/or persons appointed by the Bank to inspect the Site, assets, and/or all accounts and records relating to the performance of the Contract and the selection process to provide the Services, and to have such accounts and records audited by auditors appointed by the Bank if requested by the Bank. The Consultant's attention is drawn to Clause GCC 10 which provides, among others, that acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under this Clause GCC25.2 constitute an integrity violation subject to contract termination (as well as to a determination of ineligibility under the Bank's Anticorruption Policy and Integrity Principles and Guidelines.)</p>
26. Reporting Obligations	26.1 The Consultant shall submit the reports and documents specified in Appendix A to the Client, in the form, in the numbers and within the time periods set forth in the said Appendix.
27. Proprietary Rights of the Client in Reports and Records	<p>27.1 Unless otherwise indicated in the SCC, all reports and relevant data and information such as maps, diagrams, plans, databases, other documents and software, or supporting records or materials compiled or prepared by the Consultant for the Client in the course of the Services shall be confidential and become and remain the absolute property of the Client. The Consultant shall deliver all such documents to the Client, together with a detailed inventory thereof not later than upon termination or expiration of this Contract. The Consultant may retain a copy of these documents, data and/or software but shall not use the same for purposes unrelated to this Contract without prior written approval of the Client.</p> <p>27.2 If license agreements are necessary or appropriate between the Consultant and third parties for purposes of development of the plans, drawings, specifications, designs, databases, other documents and software, the Consultant shall obtain the Client's prior written approval to such agreements, and at its discretion, the Client shall be entitled to require recovering the expenses related to the development of the program(s) concerned. Other restrictions about the future use of these documents and software, if any, shall be specified in the SCC.</p>

<p>28. Equipment, Vehicles and Materials</p>	<p>28.1 Equipment, vehicles, and materials made available to the Consultant by the Client, or purchased by the Consultant wholly or partly with funds provided by the Client, shall be the property of the Client and shall be marked accordingly. Upon termination or expiration of this Contract, the Consultant shall make an inventory of such equipment, vehicles, and materials available to the Client and shall dispose of the equipment, vehicles, and materials in accordance with the Client's instructions. While in possession of such equipment, vehicles, and materials, the Consultant, unless otherwise instructed by the Client in writing, shall insure them at the expense of the Client in an amount equal to their full replacement value.</p> <p>28.2 Any equipment or materials brought by the Consultant or its Experts into the Client's country for the use either for the project or personal use shall remain the property of the Consultant or the Experts concerned, as applicable.</p>
---	--

D. CONSULTANT'S EXPERTS AND SUB-CONSULTANTS

<p>29. Description and Obligations of Key Experts</p>	<p>29.1 The title, agreed job description, minimum qualification and estimated period of engagement to carry out the Services of each of the Consultant's Key Experts are described in Appendix B.</p> <p>29.2 The Consultant shall require all Experts and Sub-consultants to observe the highest level of ethical and behavioral standards and shall refrain from any form of bullying, harassment, discrimination and misconduct including sexual harassment and abuse and shall, at all times, behave in a manner that creates an environment free of bullying, harassment, discrimination and misconduct.</p> <p>29.3 If the Consultant becomes aware that an Expert or Sub-consultant may have been involved in any form of bullying, harassment, discrimination or misconduct, the Consultant shall immediately inform the Client of the issue and provide the Client with (a) as much information concerning the issue as is reasonably available to the Consultant, (b) a description of what investigation, review or other steps the Consultant is taking with respect to such issue, and (c) any additional information that the Client may require. If the Consultant receives or becomes aware of any allegation or report of possible bullying, harassment, discrimination or misconduct by any Expert or Sub-consultant, the Consultant shall take reasonable and immediate steps to investigate or verify such incident rigorously, diligently and expeditiously, and shall ensure that it has the power and legal authority to suspend or terminate such Expert or Sub-consultant. If the Client determines in its sole discretion that any possible allegation or report of possible bullying, harassment, discrimination or misconduct by any Expert or Sub-consultant could adversely affect people working at or associated with the project or the reputation of the Client or Government (or agency of the Government), then the Consultant shall, forthwith at</p>
--	--



	the request of the Client, suspend or physically separate such Expert or Sub-consultant from the project and such persons.
30. Replacement of Key Experts	<p>30.1 Except as the Client may otherwise agree in writing, no changes shall be made in the Key Experts.</p> <p>30.2 Notwithstanding GCC 30.1, the substitution of Key Experts during Contract execution may be considered only based on the Consultant's written request and due to circumstances outside the reasonable control of the Consultant, including but not limited to death or medical incapacity. In this case, the Consultant shall forthwith provide as a replacement, a person of equivalent or better qualifications and experience, and at the same rate of remuneration.</p>
31. Removal of Experts or Sub-Consultants	<p>31.1 If the Client or the Consultant finds that any of the Experts or Sub-Consultant has breached Clause 29.2 or has been charged with having committed a criminal action, or if the Client determines that the Consultant's Expert or Sub-Consultant has engaged in corrupt, fraudulent, collusive, or coercive <i>[or obstructive]</i> practice while performing the Services, the Consultant shall, at the Client's written request, provide a replacement.</p> <p>31.2 In the event that any of Key Experts, Non-Key Experts or Sub-Consultants is found by the Client to be incompetent or incapable in discharging assigned duties, the Client, specifying the grounds therefore, may request the Consultant to provide a replacement.</p> <p>31.3 Any replacement of the removed Experts or Sub-Consultants shall possess better qualifications and experience and shall be acceptable to the Client.</p> <p>31.4 The Consultant shall bear all costs arising out of or incidental to any removal and/or replacement of such Experts.</p>

E. OBLIGATIONS OF THE CLIENT

32. Assistance and Exemptions	<p>32.1 Unless otherwise specified in the SCC, the Client shall use its best efforts to:</p> <p>(a) Assist the Consultant with obtaining work permits and other documents necessary to enable the Consultant to perform the Services.</p> <p>(b) Assist the Consultant with promptly obtaining, for the Experts and, if appropriate, their eligible dependents, all necessary entry and exit visas, residence permits, exchange permits, and any other documents required for their stay in the Client's country while carrying out the Services under the Contract.</p> <p>(c) Facilitate prompt clearance through customs of any property required for the Services and of the personal effects of the Experts and their eligible dependents.</p> <p>(d) Issue all instructions and information to officials, agents and</p>
--------------------------------------	--

	<p>representatives of the Government that may be necessary or appropriate for the prompt and effective implementation of the Services.</p> <p>(e) Assist the Consultant, the Experts, and any Sub-Consultants employed by the Consultant for the Services with obtaining exemption from any requirement to register or obtain any permit to practice their profession or to establish themselves either individually or as a corporate entity in the Client's country according to the applicable law in the Client's country.</p> <p>(f) Assist the Consultant, any Sub-Consultants and their Experts with obtaining the privilege, pursuant to the applicable law in the Client's country, of bringing into the Client's country reasonable amounts of foreign currency for the purposes of the Services or for the personal use of the Experts and of withdrawing any such amounts as may be earned therein by the Experts in the execution of the Services.</p> <p>(g) Provide to the Consultant any such other assistance as may be specified in the SCC.</p>
33. Access to Project Site	<p>33.1 The Client warrants that the Consultant shall have, free of charge, unimpeded access to the project site as required to perform the Services. The Client will be responsible for any damage to the project site or any property thereon resulting from such access and will indemnify the Consultant and Experts of liability for any such damage, unless the damage was caused by the willful default or negligence of the Consultant or any Sub-Consultants or their Experts.</p>
34. Change in the Applicable Law Related to Taxes and Duties	<p>34.1 If, after the date of this Contract, there is any change in the applicable law in the Client's country with respect to taxes and duties that increases or decreases the cost incurred by the Consultant in performing the Services, the remuneration and reimbursable expenses otherwise payable to the Consultant under this Contract shall be increased or decreased accordingly by agreement between the Parties hereto, and corresponding adjustments shall be made to the Contract price amount specified in Clause GCC 38.1.</p>
35. Services, Facilities and Property of the Client	<p>35.1 The Client shall make the services, facilities, and property described in the Terms of Reference (Appendix A) available to the Consultant and the Experts for the purposes of the Services and free of any charge, the at the times and in the manner specified in said Appendix A.</p>
36. Counterpart Personnel	<p>36.1 The Client shall make such professional and support counterpart personnel available to the Consultant free of charge. These personnel shall be nominated by the Client with the Consultant's advice, if specified in Appendix A.</p> <p>36.2 Professional and support counterpart personnel, excluding the Client's liaison personnel, shall work under the exclusive</p>

	direction of the Consultant. If any member of the counterpart personnel fails to adequately perform any work assigned to the member by the Consultant that is consistent with the position occupied by the member, the Consultant may request the replacement of the member, and the Client shall not unreasonably refuse to act upon the request.
37. Payment Obligation	37.1 In consideration of the Services performed by the Consultant under this Contract, the Client shall pay the Consultant for the deliverables specified in Appendix A and in the manner as is provided by GCC F below.

F. PAYMENTS TO THE CONSULTANT

38. Contract Price	<p>38.1 The Contract price is fixed and is set forth in the SCC. The Contract price breakdown is provided in Appendix C.</p> <p>38.2 Any change to the Contract price specified in Clause 38.1 can be made only if the Parties have agreed to the revised scope of Services pursuant to Clause GCC 16 and have amended in writing the Terms of Reference in Appendix A.</p>
39. Taxes and Duties	<p>39.1 The Consultant, Sub-Consultants, and Experts are responsible for meeting any and all tax liabilities arising out of the Contract unless it is stated otherwise in the SCC.</p> <p>39.2 As an exception to the above and as stated in the SCC, all local identifiable indirect taxes and other local taxes which are not included in the Consultant's Financial proposal in accordance with ITC 25, which are itemized and finalized at Contract negotiations, are reimbursed to the Consultant or are paid by the Client on behalf of the Consultant.</p>
40. Currency of Payment	40.1 Any payment under this Contract shall be made in the currency(ies) of the Contract.
41. Mode of Billing and Payment	<p>41.1 The total payments under this Contract shall not exceed the Contract price set forth in Clause GCC 38.1.</p> <p>41.2 The payments under this Contract shall be made in Lump Sum installments against deliverables specified in Appendix A. The payments will be made according to the payment schedule stated in the SCC.</p> <p>41.2.1 Advance payment. Unless otherwise indicated in the SCC, an advance payment shall be made against an advance payment bank guarantee acceptable to the Client in an amount (or amounts) and in a currency (or currencies) specified in the SCC. Such guarantee (i) is to remain effective until the advance payment has been fully set off, and (ii) is to be in the form set forth in Appendix D, or in such other form as the Client shall have approved in writing. The advance payments will be set off by the Client in equal portions against the Lump</p>

	<p>Sum installments specified in the SCC until the advance payments have been fully set off.</p> <p>41.2.2 Lump Sum installment payments. The Client shall pay the Consultant within 60 days after the receipt by the Client of the deliverable(s) and the cover invoice for the related Lump Sum installment payment. The payment can be withheld if the Client does not approve the submitted deliverable(s) as satisfactory in which case the Client shall provide comments to the Consultant within the same 60-day period. The Consultant shall thereupon promptly make any necessary corrections, and thereafter the foregoing process shall be repeated.</p> <p>41.2.3 Final payment. The final payment under this Clause shall be made only after the Consultant has submitted and the Client has approved the final report as satisfactory. The Services shall then be deemed completed and finally accepted by the Client. The last Lump Sum installment shall be deemed approved for payment by the Client within 90 calendar days after receipt of the final report by the Client unless the Client, within this 90-calendar day period, gives written notice to the Consultant specifying in detail deficiencies in the Services and the final report. The Consultant shall thereupon promptly make any necessary corrections, and thereafter the foregoing process shall be repeated.</p> <p>41.2.4 All payments under this Contract shall be made to the accounts of the Consultant specified in the SCC.</p> <p>41.2.5 With the exception of the final payment under 41.2.3 above, payments do not constitute acceptance of the whole Services nor relieve the Consultant of any obligations hereunder.</p>
<p>42. Interest on Delayed Payments</p>	<p>42.1 If the Client had delayed payments beyond 15 days after the due date stated in Clause GCC 41.2.2, interest shall be paid to the Consultant on any amount due by, not paid on, the due date for each day of delay at the annual rate stated in the SCC.</p>

G. FAIRNESS AND GOOD FAITH

<p>43. Good Faith</p>	<p>43.1 The Parties undertake to act in good faith with respect to each other's rights under this Contract and to adopt all reasonable measures to ensure the realization of the objectives of this Contract.</p>
------------------------------	--

H. SETTLEMENT OF DISPUTES

<p>44. Amicable Settlement</p>	<p>44.1 The Parties shall seek to resolve any dispute amicably by mutual consultation.</p> <p>44.2 If either Party objects to any action or inaction of the other Party, the objecting Party may file a written Notice of Dispute to the</p>
---------------------------------------	--

	other Party providing in detail the basis of the dispute. The Party receiving the Notice of Dispute will consider it and respond in writing within 14 days after receipt. If that Party fails to respond within 14 days, or the dispute cannot be amicably settled within 14 days following the response of that Party, Clause GCC 45.1 shall apply.
45. Dispute Resolution	45.1 Any dispute between the Parties arising under or related to this Contract that cannot be settled amicably may be referred to by either Party to the adjudication or arbitration in accordance with the provisions specified in the SCC .

I. ELIGIBILITY

46. Eligibility	46.1 Compliance with the Bank's eligibility policy is required throughout the Contract's execution.
------------------------	---

II. General Conditions

Attachment 1: Bank's Anticorruption Policy

Anticorruption Policy

ADB requires borrowers (including beneficiaries of ADB-financed activity) and their personnel, as well as firms and individuals participating in an ADB-financed activity, including but not limited to, bidders suppliers, contractors, consultants, subcontractors, subconsultants and agents (including their respective officers, directors, employees and personnel) under ADB-financed contracts, to observe the highest standard of ethics during the selection process and in execution of such contracts in accordance with ADB's Anticorruption Policy (1998, as amended from time to time). In pursuance of this policy, ADB

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
- (i) "Corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to improperly influence the actions of another party.
 - (ii) "Fraudulent practice" means any action or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation.
 - (iii) "Coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to improperly influence the actions of a party.
 - (iv) "Collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.
 - (v) Abuse, means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard.
 - (vi) Conflict of interest, means any situation in which a party has interests that could improperly influence a party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations.
 - (vii) Integrity violation is any act which violates ADB's Anticorruption Policy, including items (i) to (vi) above and the following: obstructive practice, abuse, conflict of interest, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standards.
- (b) will reject a proposal for an award if it determines that the Consultant recommended for the award or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers has engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;
- (c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Client engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the Borrower having taken timely and



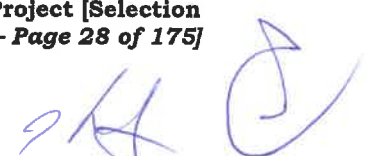
- appropriate action satisfactory to ADB to remedy the situation, including by failing to inform ADB in a timely manner at the time they knew of the integrity violations;
- (d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines (both as amended from time to time), including declaring ineligible, either indefinitely or for a stated period of time, to participate¹ in ADB-financed, -administered, or -supported activities or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations. ADB reserves the right to publish any debarment; and
- (e) will have the right to require that a provision be included in request for proposals and in Contracts financed, administered or supported by ADB, requiring Consultants and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel to permit ADB or its representative to inspect their accounts and records and other documents relating to the selection process and contract performance and to have them audited by auditors appointed by ADB.

All Bidders, Consultants, contractors, suppliers, manufacturers, service providers, and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel, are obliged to cooperate fully in any investigation when requested by ADB to do so. As determined on a case by case basis by ADB, such cooperation includes, but is not limited to, the following:

- (a) being available to be interviewed and replying fully and truthfully to all questions asked;
- (b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;
- (c) upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;
- (d) cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communications Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);
- (e) cooperating in any testing or examination requested by ADB;
- (f) providing all other information relevant for the exercise of ADB's audit or inspection rights; and
- (g) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.

All bidders, Consultants, contractors and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in its contract with its sub-consultants, Subcontractors, and other third parties engaged or involved in ADB-related activities, such

¹ Whether as a Consultant, Sub-Consultant or Key Expert; or in any other capacity specified in the Contract



sub-consultants, Subcontractors, and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.

The Borrower hereby puts the Bidder on notice that the Bidder or any joint venture partner of the Bidder (if any) may not be able to receive any payments under the Contract if the Consultant or any of its joint venture partners, as appropriate, is, or is owned (in whole or in part) by a person or entity subject to applicable sanctions.



245 ✓

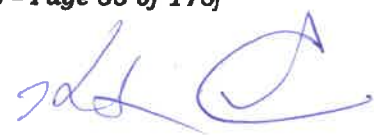
III. Special Conditions of Contract

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract								
1 (b)	<p><u>Applicable Guidelines</u> ADB Procurement Policy (2017, as amended from time to time) and ADB Procurement Directives for ADB Borrowers (January 2026)</p>								
1 (c) and 3.1	<p><u>Applicable Law</u> The Contract shall be construed in accordance with the law of Islamic Republic of Pakistan</p>								
4.1	<p><u>Language</u> The language is English.</p>								
6.1 and 6.2	<p><u>Contact Details</u></p> <table border="1"> <tr> <td>Client:</td> <td>Ministry of Railways, Government of Pakistan</td> </tr> <tr> <td>Attention:</td> <td> Muhammad Amjad Iqbal Project Director Project Implementation Unit Main Line-1 (ML-1), Pakistan Railways Railway Improvement Project Government of Pakistan Lahore Address: 3 Mayo Gardens, Sunderdas Road Lahore, Punjab Pakistan Contact: +92-42-99202372 E-mail: pdpiu@pakrail.gov.pk </td> </tr> </table> <table border="1"> <tr> <td>Consultant:</td> <td>M/s Dohwa Engineering Co., Ltd. – [Republic of Korea]</td> </tr> <tr> <td>Attention:</td> <td> Mr. Kim, Chang Pil Head of Railway Department 1 438, Samseong-ro, Gangnam-gu, Seoul, Korea 06178 Contact: +82-2-6323-4768 Email: cpkim@dohwa.co.kr </td> </tr> </table>	Client:	Ministry of Railways, Government of Pakistan	Attention:	Muhammad Amjad Iqbal Project Director Project Implementation Unit Main Line-1 (ML-1), Pakistan Railways Railway Improvement Project Government of Pakistan Lahore Address: 3 Mayo Gardens, Sunderdas Road Lahore, Punjab Pakistan Contact: +92-42-99202372 E-mail: pdpiu@pakrail.gov.pk	Consultant:	M/s Dohwa Engineering Co., Ltd. – [Republic of Korea]	Attention:	Mr. Kim, Chang Pil Head of Railway Department 1 438, Samseong-ro, Gangnam-gu, Seoul, Korea 06178 Contact: +82-2-6323-4768 Email: cpkim@dohwa.co.kr
Client:	Ministry of Railways, Government of Pakistan								
Attention:	Muhammad Amjad Iqbal Project Director Project Implementation Unit Main Line-1 (ML-1), Pakistan Railways Railway Improvement Project Government of Pakistan Lahore Address: 3 Mayo Gardens, Sunderdas Road Lahore, Punjab Pakistan Contact: +92-42-99202372 E-mail: pdpiu@pakrail.gov.pk								
Consultant:	M/s Dohwa Engineering Co., Ltd. – [Republic of Korea]								
Attention:	Mr. Kim, Chang Pil Head of Railway Department 1 438, Samseong-ro, Gangnam-gu, Seoul, Korea 06178 Contact: +82-2-6323-4768 Email: cpkim@dohwa.co.kr								
8.1	<p><u>Lead Member of Joint Venture</u> <i>Not Applicable</i></p>								



9.1	<p><u>Authorized Representatives</u></p> <p>The Authorized Representatives are:</p> <p>For the Client: Project Director, Project Implementation Unit, Main Line-1 (ML-1), Pakistan Railways, Railway Improvement Project, Government of Pakistan, Lahore</p> <p>For the Consultant: Kim, Chang Pil, Head of Railway Department 1, Dohwa Engineering Co., Ltd., Republic of Korea, 438, Samseong-ro, Gangnam-gu, Seoul, Korea 06178</p>
11.1	<p><u>Conditions of Effectiveness of Contract</u></p> <p>Signing of the Contract</p>
12.1	<p>Termination of Contract for Failure to Become Effective:</p> <p>The time period shall be three (03) months from the date the Contract was signed.</p>
13.1	<p>Commencement of Services:</p> <p>The number of days shall be Five (05) days after the effective date of Contract.</p> <p>Confirmation of Key Experts' availability to start the Assignment shall be submitted to the Client in writing as a written statement signed by each Key Expert.</p>
14.1	<p><u>Contract Period</u></p> <p>Expiration of Contract:</p> <p>The time period shall be eighteen (18) months after the effective date of Contract.</p>
21.1.3	<p><u>Conflict</u></p> <p>The Client may disqualify the Consultant from providing goods, works, or non-consulting services due to a conflict of a nature described in Clause GCC 21.1.3</p>
23.1	<p><u>Consultant's Liability</u></p> <p>The following limitation of the Consultant's Liability towards the Client can be subject to the Contract's negotiations:</p>

	<p>“Limitation of the Consultant's Liability towards the Client:</p> <p>(a) Except in the case of gross negligence or willful misconduct on the part of the Consultant or on the part of any person or a firm acting on behalf of the Consultant in carrying out the Services, the Consultant, with respect to damage caused by the Consultant to the Client, shall not be liable to the Client:</p> <p>(i) for any indirect or consequential loss or damage; and</p> <p>(ii) for any direct loss or damage that exceeds one times the total value of the Contract;</p> <p>(b) This limitation of liability shall not</p> <p>(i) affect the Consultant's liability, if any, for damage to Third Parties caused by the Consultant or any person or firm acting on behalf of the Consultant in carrying out the Services</p> <p>(ii) be construed as providing the Consultant with any limitation or exclusion from liability prohibited by the Applicable Law.</p>
24.1	<p><u>Insurance Coverage</u></p> <p>The insurance coverage against the risks shall be as follows:</p> <p>(a) Professional liability insurance, with a minimum coverage of 1.5 x Contract Amount.</p> <p>(b) Third Party motor vehicle liability insurance in respect of motor vehicles operated in the Client's country by the Consultant or its Experts or Sub-Consultants, with a minimum coverage <i>in accordance with the applicable law in the Client's country.</i></p> <p>(c) Third Party liability insurance, with a minimum coverage of PKR 1,000,000.</p> <p>(d) employer's liability and workers' compensation insurance of the Experts and Sub-Consultants in accordance with the relevant provisions of the applicable law in the Client's country, as well as, with respect to such Experts, any such life, health, accident, travel or other insurance as may be appropriate; PKR 600,000 per occurrence in case of death and PKR 150,000 per occurrence in case of injury; and</p> <p>(e) insurance against loss of or damage to (i) equipment purchased in whole or in part with funds provided under this Contract, (ii) the Consultant's property used in the performance of the Services, and (iii) any documents prepared by the Consultant in the performance of the Services.</p>
27.1	<p><u>Exceptions to Proprietary Rights</u></p> <p>No exception to proprietary rights provision</p>



27.2	<u>Future Use of Documents</u> The Consultant shall not use any documents, software and / or deliverables produced under the Contract or any information that is directly or indirectly linked with this Contract for purposes unrelated to this Contract without the prior written approval of the Client.
32.1 (a) through (f)	<u>Assistance and Exemptions</u> The Government of Pakistan (GoP) shall extend assistance to the Consultant for necessary security clearance for the Consultant's Experts. GoP assistance shall be limited up to the extent of acquiring the security clearance / No Objection Certificate (NOC) etc.
32.1(g)	<u>Other Assistance to be Provided by Client</u> Not Applicable



38.1

Contract Price

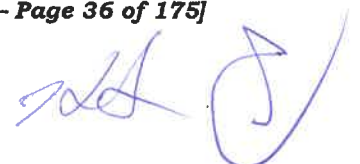
The Contract price is: USD 1,912,399 (One Million Nine Hundred Twelve Thousand Three Hundred Ninety-nine US Dollars Only) and PKR 661,348,607 (Six Hundred Sixty-one Million Three Hundred Forty-eight Thousand Six Hundred Seven Pakistani Rupees Only) exclusive of local indirect taxes and other local taxes which are not included in the Consultant's Financial proposal in accordance with ITC 25.

Breakdown of the Foreign Component (FC) and Local Component (LC) of the Contract Price is as under:

S/No	Item	USD	PKR
1	Remuneration of Key Experts	973,986.0	100,261,810.0
2	Remuneration of Non-Key Experts	832,056.0	236,610,380.0
3	Reimbursable Expenses	106,357.0	324,476,417.0
4	Total (1 to 3)	1,912,399.0	661,348,607.0
5	Punjab Sales Tax on Services (PRA) @16% on Foreign and Local Component (Serial No. 4 above)	305,983.84	105,815,777.12
6	Additional Income Tax on Non-Residents Remuneration in Client's Country (15%) (Serial No. 1+2)	270,906.30	-
7	Total Amount of Tax (5 + 6)	576,890.14	105,815,777.12
8	Total Contract Price (4 + 7)	2,489,289.14	767,164,384.12

Any indirect local taxes and other local taxes which are not included in the Consultant's Financial proposal in accordance with ITC 25 chargeable in respect of this Contract for the Services provided by the Consultant shall be paid by the Client for the Consultant.

39.1 and 39.2	<p><u>Taxes and Duties</u></p> <p>The Client shall pay on behalf of the Consultant, the Sub-Consultants and the Experts, any local indirect taxes and other local taxes in accordance with GCC 39.2, duties, fees, levies, and other impositions imposed, under the applicable law in the Client's country, on the Consultant, the Sub-Consultants, and the Experts in respect of:</p> <ul style="list-style-type: none"> (a) any payments whatsoever made to the Consultant, Sub-Consultants and the Experts (other than nationals or permanent residents of the Client's country), in connection with the carrying out of the Services; (b) any equipment, materials and supplies brought into the Client's country by the Consultant or Sub-Consultants for the purpose of carrying out the Services and which, after having been brought into such territories, will be subsequently withdrawn by them; (c) any equipment imported for the purpose of carrying out the Services and paid for out of funds provided by the Client and which is treated as property of the Client; and (d) any property brought into the Client's country by the Consultant, any Sub-Consultants or the Experts (other than nationals or permanent residents of the Client's country), or the eligible dependents of such experts for their personal use and which will subsequently be withdrawn by them upon their respective departure from the Client's country, provided that: <ul style="list-style-type: none"> i) the Consultant, Sub-Consultants and experts shall follow the usual customs procedures of the Client's country in importing property into the Client's country; and ii) if the Consultant, Sub-Consultants or Experts do not withdraw but dispose of any property in the Client's country upon which customs duties and taxes have been exempted, the Consultant, Sub-Consultants or Experts, as the case may be, (a) shall bear such customs duties and taxes in conformity with the regulations of the Client's country, or (b) shall reimburse them to the Client if they were paid by the Client at the time the property in question was brought into the Client's country.
---------------	---



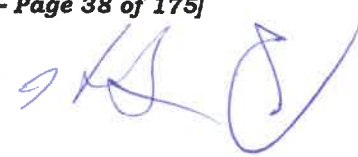
41.2

The payment schedule:

Lump sum payments milestones for the assignment

S/No	Deliverable / Milestone	Percentage of Total Contract Price (%)
1	Inception Report	10%
OUTPUT 1: DESIGN REVIEW, VETTING & VALUE ENGINEERING		35%
2	Design Review & Technical Due-Diligence Report (Civil, Track, Buildings, Systems)	10%
3	Value Engineering Report & Optimization Recommendations including Master Plan	15%
4	Updated Detailed Designs, BOQs, Tender Drawings & Bidding Documents	10%
OUTPUT 2: INSTITUTIONAL STRENGTHENING & CAPACITY BUILDING		25%
5	Institutional Assessment & Business Model Review	05%
6	Priority Institutional Reforms, Policies & Implementation Roadmap	10%
7	Capacity-Building Plan & Training Delivery Completion Report	10%
OUTPUT 3: Enhanced Financial Performance and Commercial Optimization		20%
8	Financial Performance Enhancement Strategy	10%
9	Commercialization, Real Estate & PPP Development Package	10%
FINAL & OVERARCHING DELIVERABLES		10%
10	Draft Final Consolidated Report	05%
11	Final Report (Incorporating Client Feedback)	05%
Total		100%

41.2.1	<p><u>Advance Payments</u></p> <p>The following provisions shall apply to the advance payment and the advance bank payment guarantee:</p> <ol style="list-style-type: none"> (1) An advance payment of 20% in foreign currency and of 20% in local currency shall be made within 28 days after the receipt of an advance bank payment guarantee by the Client. The advance payment will be recovered by the Client by recovering 20% against each Invoice submitted by the Consultant until the advance payment until fully recovered. (2) The advance bank payment guarantee shall be in the amount and in the currency of the currency(ies) of the advance payment. (3) The bank guarantee will be released when the advance payment has been fully set off.
41.2.4	<p><u>The Consultant's Accounts</u></p> <p>The accounts are:</p> <p>for foreign currency (USD): Beneficiary: DOHWA ENGINEERING CO LTD Account No.: 25791000835132 Address: 438 Samseong-ro Gangnam-gu, Seoul, Korea 06178 Bank Name: KEB Hana Bank Branch Name: Samseong-yeok Corporate Banking Center SWIFT Code: KOEXKRSE or KOEXKRSEXXX Bank Address: 061-73 26, Yeongdong-daero 96-gil, Gangnam-gu, Soul Bank Telephone: +82-2-565-1111</p> <p>for local currency: Beneficiary: DOHWA ENGINEERING CO. LTD IBAN: PK31UNIL0109000200354507 Account No.: 200354507 Bank Name: United Bank Limited Branch Name: 1092-JAMAL PLAZA F-10 MARKAZ ISB Bank Address: 1092-JAMAL PLAZA F-10 MARKAZ ISB</p>
42.1	<p><u>Interest rate on delayed payments</u></p> <p>The interest rate is: 1.5%</p>
45.1	<p><u>Dispute Resolutions</u></p> <p>Disputes shall be settled by arbitration in accordance with the following provisions:</p> <ol style="list-style-type: none"> 1. Selection of Arbitrators. Each dispute submitted by a Party to arbitration shall be heard by a sole arbitrator or an arbitration panel composed of three (03) arbitrators, in accordance with the following



	<p>provisions:</p> <p>(a) Where the Parties agree that the dispute concerns a technical matter, they may agree to appoint a sole arbitrator or, failing agreement on the identity of such sole arbitrator within thirty (30) days after receipt by the other Party of the proposal of a name for such an appointment by the Party who initiated the proceedings, either Party may apply to the President of the Singapore International Arbitration Centre (SIAC), Singapore for a list of not fewer than five (5) nominees and, on receipt of the list, the Parties shall alternately strike names therefrom, and the last remaining nominee on the list shall be the sole arbitrator for the matter in dispute. If the last remaining nominee has not been determined in this manner within sixty (60) days of the date of the list, the President of the Singapore International Arbitration Centre (SIAC), Singapore shall appoint, upon the request of either Party and from such list or otherwise, a sole arbitrator for the matter in dispute.</p> <p>(b) Where the Parties do not agree that the dispute concerns a technical matter, the Client and the Consultant shall each appoint one (1) arbitrator, and these two arbitrators shall jointly appoint a third arbitrator, who shall chair the arbitration panel. If the arbitrators named by the Parties do not succeed in appointing a third arbitrator within thirty (30) days after the second arbitrator named by the Parties has been appointed, the third arbitrator shall, at the request of either Party, be appointed by the International Chamber of Commerce, Paris. be appointed by <i>the Secretary General of the Permanent Court of Arbitration, The Hague</i>.</p> <p>(c) If, in a dispute subject to paragraph (b) above, one Party fails to appoint its arbitrator within thirty (30) days after the other Party has appointed its arbitrator, the Party that has named an arbitrator may apply to the International Chamber of Commerce, Paris to appoint a sole arbitrator for the matter in dispute, and the arbitrator appointed pursuant to such application shall be the sole arbitrator for that dispute.</p> <p>2. Rules of Procedure. Except as otherwise stated herein, arbitration proceedings shall be conducted in accordance with the rules of procedure for arbitration of the United Nations Commission on International Trade Law (UNCITRAL) as in force on the date of this Contract.</p> <p>3. Substitute Arbitrators. If, for any reason, an arbitrator is unable to perform his or her function, a substitute shall be appointed in the same manner as the original arbitrator.</p> <p>4. Nationality and Qualifications of Arbitrators. The sole arbitrator or the third arbitrator appointed pursuant to paragraphs 1(a) through 1(c) above shall be an internationally recognized legal or technical expert with extensive experience in relation to the matter in dispute and shall not be a national of the Consultant's home country or of the home</p>
--	---

	<p>country of any of their members or Parties or of the Government's country. For the purposes of this Clause, "home country" means any of:</p> <ul style="list-style-type: none"> (a) the country of incorporation of the Consultant or of any of their members or Parties; or (b) the country in which the Consultant's [or any of their members' or Parties'] principal place of business is located; or (c) the country of nationality of a majority of the Consultant's [or of any members' or Parties'] shareholders; or (d) the country of nationality of the Sub-Consultants concerned, where the dispute involves a subcontract. <p>5. Miscellaneous. In any arbitration proceeding hereunder:</p> <ul style="list-style-type: none"> (a) proceedings shall, unless otherwise agreed by the Parties, be held in Singapore or a country selected and agreed by both the Parties i.e., the Client and the Consultants. (b) the English language shall be the official language for all purposes; and (c) the decision of the sole arbitrator or of a majority of the arbitrators (or of the third arbitrator if there is no such majority) shall be final and binding and shall be enforceable in any court of competent jurisdiction, and the Parties hereby waive any objections to or claims of immunity in respect of such enforcement. <p><u>For National Consultants:</u> Disputes shall be settled by arbitration in accordance with the provisions of Arbitration Act 1940 of Pakistan, as amended from time to time:</p> <ul style="list-style-type: none"> 1. Selection of Arbitrators. Each dispute submitted by a Party to arbitration shall be heard by a sole arbitrator or an arbitration panel composed of three (3) arbitrators, in accordance with the provisions of Arbitration Act 1940 of Pakistan, as amended from time to time. 2. Rules of Procedure. Except as otherwise stated herein, arbitration proceedings shall be conducted in accordance with the provisions of Arbitration Act 1940 of Pakistan, as amended from time to time. 3. Miscellaneous. In any arbitration proceeding hereunder: <ul style="list-style-type: none"> (a) proceedings shall, unless otherwise agreed by the Parties, be held in Lahore Pakistan. (b) the English language shall be the official language for all purposes; and (c) the decision of a majority of the arbitrators (or of the third arbitrator if there is no such majority) shall be final and binding and shall be enforceable in any court of competent jurisdiction, and the Parties hereby waive any objections to or claims of immunity in respect of such enforcement.
--	---

IV. Appendices

APPENDIX A: TERMS OF REFERENCE



ABBRIATIONS	
ADB	Asian Development Bank
APD	Approved Preliminary Design
CAP	Corrective Action Plan
CAPEX	Capital Expenditure
CLC	Coordination & Liaison Committee
COI	Corridor of Impact
CPP	Consultation and participation plan
CPT	Cone penetration tests
CRVA	Climate Risk & Vulnerability Assessment
CTW	Central Telecom Workshop
DBR	Design Basis Reports
DED	Detailed Engineering Design
DED Consultant	Detailed Engineering Design Consultant
DMS	Detailed Measurement Survey
DSAR	Data and Site Assessment Report
DTM	Digital Terrain Models
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESRC	Environmental and Social Risk Classification
FOBs	Foot-over bridges
GAAP	Gender Assessment & Action Plan
GAP	Gender Action Plan
GHG	Greenhouse Gases
GIIP	Good international industry practice
GRM	Grievance Redress Mechanism
HFL	High Flood Level
IFRS	International Financial Reporting Standards
ISO	International Standard Organization
IVS	Independent Valuation Study
LAMS	Land and Asset Management System
LAP	Land Acquisition Plan
LARP	Land Acquisition and Resettlement Plan
LCCA	Life-Cycle Cost Analysis
LMP	Labor Management Plan
LURP	Land Use Restriction Plan
MEP	Mechanical, Electrical, and Plumbing
MIL	Master Issues Log
MoR	Ministry of Railways
MTM	Mechanized Track Maintenance
NHA	National Highway Authority
O&M	Operation & maintenance
OHE	Overhead equipment
OPD	Original Preliminary Design
OPEX	Operating Expenditure
PIU	Project Implementation Unit
PPP	Public Private Partnership
PR	Pakistan Railways
PRA	Pakistan Railway Academy
PSA	Poverty and Social Assessment
PSO	Public Service Obligation

ABBREVIATIONS	
PSP	Private Sector Participation
PSQCA	Pakistan Standards & Quality Control Authority
RC	Review Consultant
RFI	Request for Information
RVE	Review, Vetting, and Value Engineering
SBDs	Standard Bidding Documents
SDDR	Social Due Diligence Report
SEP	Stakeholder Engagement Plan
SPRSS	Summary poverty reduction and social strategy
SPT	Standard Penetration Tests
TOD	Transit-oriented development
TOR	Terms Of Reference
ToT	Training-of-Trainers
VE	Value Engineering
VEPs	VE Proposals
VGf	Viability gap funding



TERMS OF REFERENCES**Consultancy Services for Design Review, Institutional Strengthening, and PPP/Commercialization for the ML-1 Karachi – Rohri Upgradation (480 km)****A. PROJECT BACKGROUND**

1. The Government of Pakistan has received a loan from Asian Development Bank (ADB) to finance the preparatory activities of Karachi – Rohri Section (480 km), ML-1 Upgradation Project (the Project). The Project aims to modernize the busiest segment of Pakistan's Main Line-1 (ML-1) railway, increasing line speeds up to 160 km/h for passenger and up to 120 km/h for freight, deploying modern signaling and telecom systems, reducing level crossings, and enhancing climate resilience and operational efficiency.
2. **Implementation arrangements:** The Project will be executed by the Ministry of Railways / Pakistan Railways (ML-1 Project Directorate) (Executing Agency) through a Project Implementation Unit (PIU). Team Leader / PIU ML-1 Project, shall act as Client to coordinate, manage, monitor and evaluate all aspects of Project implementation on behalf of Pakistan Railways.
3. **Project description:** The Project will involve the comprehensive upgrade of a 480-kilometer section of the ML-1 railway between Karachi and Rohri. Key components include track re-alignment and strengthening, rehabilitation and new construction of bridges and culverts, modernization of stations and freight yards, and installation of new signaling, telecommunication, and ICT systems. The design shall have provision for future 25kV electric Traction System.
4. **Previous work:** A Detailed Engineering Design (DED) for the Karachi--Rohri section has been prepared by a Design Consultant. The Consultant under this assignment will conduct an independent Review, Vetting, and Value Engineering of this existing design work by others.
5. **Previous investigations and surveys:** The Design Consultant conducting extensive surveys including geodetic control, topographic, geotechnical, hydrological, utility mapping, and existing condition surveys. The Consultant will verify this base data.
6. **Related Projects:** The ML-1 Upgradation is a critical component of the Pakistan's National Transport Policy. The Consultant shall be aware of and ensure compatibility with broader national infrastructure initiatives.
7. **Project costs and financing:** The project's estimated cost is to be determined based on reviewed detailed design and final cost estimates prepared by the consultant under this study and will be financed by a loan from ADB as a lead partner, potential co-financing from other development partners, and government counterpart funding.

B. PURPOSE OF THE ASSIGNMENT

8. The main objective of this assignment is to engage an independent Review, Vetting, and Value Engineering (RVE) Consultant to critically assess the existing Design work /Detailed Engineering Design (DED), submitted in compliance of respective Terms of Reference for Karachi – Rohri section. This document shall be called TOR-DED in the next section of this document. The goal is to ensure the design is technically sound, compliant with international standards and ADB safeguards, cost-effective, constructable, and ready for international competitive bidding.
9. To achieve the main objective, this study is divided into three (03) main outputs as summarized below:



- (a) **Output-1: Design Review, Vetting & Value Engineering** - Conduct independent verification and review of all survey data and investigation reports forming the basis of the DED. Perform a comprehensive, multi-disciplinary technical review of the DED, including civil, track, structural, station, and systems designs. Undertake a systematic Value Engineering (VE) study to identify and recommend cost-effective alternatives without compromising safety, quality, or performance, finalization of packages, due diligence reports and documents, tender drawings, bill of quantities, cost estimates, bidding documents etc. The consultant shall also provide procurement support for the hiring of contractors, service providers etc. The detailed engineering design should incorporate VE considerations, including provisions for future electrification and climate-resilient features.
- (b) **Output-2: Institutional Reform & Capacity Building** - Conduct a thorough diagnostic review of the Client's operational, financial, and commercial performance. Develop a comprehensive business plan, including vision, mission, commercial strategy, financial projections, operation & maintenance regime and an implementation roadmap. The consultant shall also conduct a gap analysis between the Client's current accounting practices and International Financial Reporting Standards (IFRS) and develop a phased transition plan. Develop Public Service Obligation (PSO) policy, legal framework, and model contracts. Provide hands-on support and training to build sustainable internal capacity for the implementation of these reforms.
- (c) **Output-3: Enhanced Financial Performance and Commercial Optimization** - The consultant shall develop and implement a comprehensive set of interventions to improve the financial sustainability, commercial viability, and revenue diversification of Pakistan Railways (PR), with a focus on the Karachi-Rohri section. Activities will emphasize unlocking non-fare revenue, optimizing asset utilization, strengthening cost recovery, and structuring private sector participation mechanisms. The institutional integration, documentation, policies and identification of priority initiatives, detailed design of the priority projects, preparation of bidding documents etc. all falls under the responsibility of the consultant. For detailed tasks please refer to next section of the document.
10. The Consultant will be required to familiarize itself with the Financing Documents related to the Project and other ADB key documents including those which govern lending policies and practices including, but not limited to:
- ADB Environmental and Social Framework (ESF 2024)
 - ADB Procurement Policy (2017)
 - ADB Procurement Directive for ADB Borrowers Goods, Works, Nonconsulting, and Consulting Services (January 2026)
 - Other related ADB policies, strategies or procedures as relevant to the Project

C. DURATION AND LOCATION OF THE SERVICES

11. The consulting services will be implemented in three (3) stages over an overall duration of 18 months. Stage 1 will cover the detailed design review, vetting, and value engineering activities and shall be completed within the first 8 months, while procurement support activities under this output will continue until Month 18. Stage 2, comprising Output 2 on institutional reform and capacity building, will commence in parallel with Stage 1 and shall be completed within 12 months from contract effectiveness, while implementation support will continue until Month 18. Stage 3 will cover Output 3 (Enhanced Financial Performance and Commercial Optimization) and start in parallel to stage 1 and will be completed by 18-month (contract period).



12. The Consultant shall prepare a detailed implementation schedule during the inception phase for the Client's review and approval. A tentative timeline for each output from contract commencement is provided in the table below.

Stages	Item	Description	Duration (Months)
1	Output 1:	Design Review, Vetting & Value Engineering	8
2	Output 2:	Institutional Reform & Capacity Building	12
3	Output 3:	Enhanced Financial Performance and Commercial Optimization	18

13. **Location:** The Project is located along the 480-kilometer Karachi – Rohri section of Pakistan's Main Line-1 (ML-1) railway, connecting the port city of Karachi with Rohri.
14. **Duration:** Total duration for Output 1-3 is **18 months**.
15. **Site Visit:** The Consultants are expected to conduct a site visit, which the PIU will facilitate, and that the site visit assessment must be included in the proposal and will be scored by the Consultant Selection Committee.
16. **Innovation:** The Consultants are required to propose detailed and practical innovations in construction planning and sequencing to minimize service disruptions, including the application of digital tools and technologies, as well as the integration of climate-resilient and low-carbon design solutions, wherever feasible.

D. OUTLINE SCOPE OF THE CONSULTING SERVICES

17. The Consultant under this project as part of output-1, shall undertake a comprehensive review of the Detailed Engineering Design (DED) prepared by a separate consultant (DED Consultant) hired by the client. The consultant under this project shall verify strict conformity of detailed engineering design with all provisions of the Terms and reference of the DED-Consultant, with particular emphasis on ensuring full alignment of all design inputs, criteria, and outputs with the approved Design Basis Reports (DBR). The review shall extend across all three packages defined in terms and reference of DED consultant as follows:
- (a) Package-1: Technical Design
 - (b) Package-2: Environmental & Social Safeguards Due Diligence
 - (c) Package-3: Supplementary Design / Drawings / Reports
18. The Consultant shall verify that the deliverables of each package mentioned above are aligned with the Adjusted Preliminary Design (APD) framework and with the upgradability provisions relating to the Original Preliminary Design (OPD), as specified in the respective package descriptions and ADBs requirements for Environmental & Social Safeguards Due Diligence are well incorporated in each required deliverable.
19. The review shall cover all disciplines and components of the ML-1 upgrade, including but not limited to: permanent way and track geometry; horizontal and vertical alignment; bridges and culverts; structures and buildings; signaling, interlocking and train control systems; ICT and telecommunications; stations and passenger facilities; maintenance workshops and depots; stabling yards; environmental and social safeguards integration; utilities relocation; and supporting field surveys and investigations conducted by the DED Consultant.
20. The Consultant shall independently assess whether the DED Consultant has fulfilled all obligations under the TOR-DED with respect to the completeness, adequacy, accuracy, and reliability of all design inputs, analyses, field investigations, and

- resulting outputs. Any discrepancies, omissions, inconsistencies, or non-compliance with the DBR, APD, or TOR-DED shall be identified by the Consultant, who shall prepare written observations, justifications, and required corrective measures for submission to the Client and formal communication to the DED-Consultant.
21. The Review Consultant (the consultant) shall bear full responsibility for confirming the conformity of the Detailed Engineering Design with the DBR and TOR-DED, ensuring that the final design provides a sound, verifiable, and implementable basis for construction. In addition, the Consultant shall be responsible for undertaking value engineering and proposing more economical or optimized design options, where appropriate. The Consultant shall also be responsible for preparing and finalizing all construction-ready drawings, specifications, and bidding documents based on the reviewed and optimized design. This review function shall be performed in the context of the overarching purpose of the assignment, which includes Design Review, Vetting and Value Engineering (Output 1).
 22. The consultant as part of the output 2 Institutional Reform and Capacity Building, Conduct a thorough diagnostic review of the Client's operational, financial, and commercial performance. Develop a comprehensive business plan, including vision, mission, commercial strategy, financial projections, operation & maintenance regime and an implementation roadmap. The consultant shall also conduct a gap analysis between the Client's current accounting practices and International Financial Reporting Standards (IFRS) and develop a phased transition plan. Develop Public Service Obligation (PSO) policy, legal framework, and model contracts. Provide hands-on support and training to build sustainable internal capacity for the implementation of these reforms. The detailed tasks and deliverables under this output are provided in next section of this TOR.
 23. The Consultant as part of output 3 under this project shall design and implement a comprehensive set of measures to enhance the financial sustainability and commercial performance of Pakistan Railways (PR), with particular focus on the Karachi-Rohri Section. The scope includes unlocking non-fare revenue streams, optimizing the utilization of railway assets, improving cost recovery mechanisms, and developing commercially viable business models. The Consultant shall also prepare all supporting institutional frameworks, business processes, policies, and documentation required for implementation. Responsibilities include identifying priority commercial initiatives, developing project concepts, undertaking detailed designs where required, and preparing complete bidding documents to enable downstream implementation. Detailed tasks are provided in the subsequent sections of this TOR.

E. DETAILED SCOPE OF CONSULTING SERVICES

Output 1: Design Review, Vetting & Value Engineering

E.1 Review of Existing Data

24. The Consultant shall:

- (a) The Consultant shall review all available project documents of Detailed Engineering Design (DED). This includes Feasibility Studies, Original Preliminary Design Reports, Approved Design Basis Reports (DBRs), Adjusted Preliminary Design (APD) documentation, and all available DED submissions such as drawings, design calculations, BOQs, technical specifications, reports, and digital models. The Consultant shall ensure that all documents are complete, coherent, and aligned with project requirements.



- (b) The Consultant shall assess the completeness, accuracy, and consistency of all design inputs provided by the DED Consultant. This includes identifying gaps, conflicting information, outdated inputs, or areas requiring further clarification or verification. The objective is to confirm that all design assumptions are technically sound and fully supported by reliable data.
- (c) The Consultant shall conduct a comprehensive multidisciplinary site assessment along the Karachi–Rohri corridor to confirm on-ground conditions relevant to the Detailed Engineering Design (DED). The assessment shall verify the physical context of key project elements including track alignment, structures, stations, depots, yards, bridges, culverts, utility corridors, level crossings, and related assets. Any constraints, risks, or deviations from documented design assumptions shall be identified and recorded.
- (d) The Consultant shall engage with all relevant stakeholders whose inputs or coordination may influence the design review or implementation of the project. This includes Pakistan Railways field formations, utility agencies, local authorities, and other government or private entities. All consultations shall be documented, highlighting key requirements, constraints, and coordination needs that may affect the design review process.
- (e) Based on the document review, data collection, and site reconnaissance, the Consultant shall prepare a comprehensive Data and Site Assessment Report. The report shall summarize all key findings, document inconsistencies or deficiencies, and identify data gaps requiring additional surveys, investigations, or environmental and social safeguard study / investigations. The report shall serve as a core reference for subsequent design review and value engineering tasks.

E.2 Engineering Surveys and Investigations Verification

- 25. The Client requires independent verification and review of all survey data and investigation reports that form the foundational input for the Detailed Engineering Design (DED). This review shall be a desktop review and requirement of additional field investigations (if any) shall be met through DED Consultant as described in the subsequent paras below:
- 26. The Consultant shall review all survey and field investigation data prepared by the Detailed Design Consultant (DED Consultant) as per the requirement of this TOR, to ensure adequacy for the Detailed Engineering Design (DED) of the ML-1 Karachi–Rohri section. The Consultant shall assess whether the existing surveys and investigations are sufficient to support design optimization, value engineering, and rationalized solutions.
- 27. The scope and location of the sample field verification to be carried out by the Consultant shall be agreed upon with the Client before their commencement.
- 28. The Consultant shall critically assess the methodology, accuracy, completeness, and interpretation of the following surveys and investigations submitted by the Design Consultant. The scope includes, but is not limited to, the following activities:
- 29. **Geodetic Control Survey:** Verify as necessary the accuracy and monumentation of control network, Pakistan Railway's existing chainage and benchmark system. Scrutinize the adjustment reports and coordinate data for errors.
- 30. **Topographic Survey and Digital Terrain Models (DTM):** Verify the accuracy of the topographic survey, including the specified corridor width, the methodology of Topography, and the accuracy of the deliverables as per TOR-DED. The consultant review shall include but not limited to:
 - (a) Assess the accuracy of the topographic survey, including the specified corridor width.

- (b) Assess the methodology and accuracy of Topography and its verification.
- (c) Accuracy of deliverables, ensuring grid spacing and vertical accuracy meet specified requirements.
- (d) Verify the completeness of feature mapping (existing tracks, roads, structures, vegetation, hydrological features).
- (e) Check the scale and contour interval of the delivered maps and CAD drawings, as per TOR of DED
- (f) Where additional topographic surveys are required to enable design optimization, value engineering, or rationalized solutions, the Consultant shall submit detailed requirements of additional required surveys with complete justification to the client for onward implementation. These additional required surveys once agreed by the client will be carried out by third party on direction of client. The consultant shall not cost these surveys as part of his proposal.
- (g) If any gaps, deficiencies are identified in the surveys carried out by the Detailed Design Consultant (DED Consultant), the Consultant shall prepare a detailed justification report and formally notify the Client. The client will evaluate justifications report and will determine the appropriateness of the report and will direct the DED consultant to supplement the surveys. The consultant shall not cost these surveys as part of his proposal.
- (h) The consultant shall be responsible for the compilation and provision of updated topographic surveys report for additional and supplementary surveys and deliverables in the form topo drawing / digital terrain model suitable for construction.

31. Geotechnical and Geological Investigation Review:

- (a) Assess all geotechnical and geological data collected during the APD and Preliminary Design stages, including borehole logs, Standard Penetration Tests (SPT), cone penetration tests (CPT), trial pits, laboratory testing, subgrade bearing capacity tests, and other soil and rock analyses.
- (b) Assess all additional data carried out by the DED-Consultant as part of their scope.
- (c) Verify that the data adequately supports foundation design, subgrade characterization, slope stability, and structural safety for bridges, culverts, embankments, and other key structures.
- (d) Borehole Spacing and Depth: Verify compliance with specified intervals as per TOR of DED.
- (e) In-Situ Testing: Evaluate the appropriateness and results of field tests
- (f) Review laboratory testing procedures and results for soil classification, strength, compaction, and chemical properties.
- (g) Where additional geotechnical investigations are required to enable design optimization, value engineering, or rationalized solutions, the Consultant shall submit detailed requirements of additional required surveys with complete justification to the client for onward implementation. These additional required surveys/investigations once agreed by the client will be carried out by third party on direction of client. The consultant shall not cost these surveys/investigations as part of his proposal.
- (h) If any gaps, deficiencies are identified in the surveys or investigations carried out by the Detailed Design Consultant (DED Consultant), the Consultant shall prepare a detailed justification report and formally notify the Client. The client will evaluate justifications report and will determine the appropriateness of the report and will direct the DED consultant to supplement the surveys/investigations. The consultant shall not cost these surveys/investigations as part of his proposal.



- (i) The consultant shall be responsible for the compilation and provision of updated geotechnical and geological data, including logs, laboratory test results, and analytical reports for all additional and supplementary surveys.
32. **Hydrological and Drainage Studies:** Review catchment analysis, hydrological and hydraulic models, peak discharge calculations, flood mapping, scour analysis, and the survey of High Flood Level (HFL) marks.
- (a) Assess catchment analysis and delineation using GIS and field validation.
- (b) Review the hydrological models and the derivation of peak discharge calculations for various return periods as per TOR of DED.
- (c) Check the hydraulic models used for flood mapping, scour analysis, and sizing of cross-drainage structures (culverts, bridges).
- (d) Assess the condition and capacity survey of existing drainage structures.
- (e) Review the Preliminary Design hydrological studies, including rainfall records, streamflow data, catchment delineation, flood frequency analysis, and design discharge calculations for rivers, streams, irrigation canals, and other drainage structures.
- (f) Review that existing data adequately supports the hydraulic design of bridges, culverts, and embankments, and identify any areas where refinement or additional data is required for design rationalization or value engineering.
- (g) Additional hydrological investigations shall be undertaken by the Consultant if necessary for design optimization and design update. However, if any gaps, deficiencies, or non-compliance are identified in the surveys or investigations carried out by the Detailed Design Consultant (DED Consultant) under their contractual TOR obligations, the Consultant shall prepare a detailed justification report and formally notify the Client and the DED Consultant. The DED Consultant shall accordingly rectify the observations.
- (h) Provide updated hydrological data, reports, and supporting calculations for any supplementary investigations conducted by the Consultant for design optimization.
33. **Utility Mapping Survey:** Review the comprehensiveness of the detection methodology and the accuracy of mapped utilities (type, material, diameter, depth, condition), assessing the Utility Conflict Matrix and relocation plans.
- (a) Review the respective deliverables of the utility crossing in liaison with all utility services companies.
- (b) Assess the accuracy of mapped utilities: type, material, diameter, depth, and condition.
- (c) Assess the Utility Conflict Matrix and the proposed mitigation/relocation plans for feasibility and completeness.
34. **Existing Condition Surveys:** Assess existing conditions (as per ambient of TOR-DED) assessments of tracks, ballast, sleepers, stations, bridges, culverts, and level crossings, including inventory and prioritization for upgradation.
35. **Level Crossings and other Infrastructure components:** Review the inventory of all crossings and assessment of existing safety measures.

E.3 Safeguards' Reviews and Compliance Verification/Gender mainstreaming

36. The Consultant will ensure that all environmental, social, climate, gender, and land acquisition, land use restriction, Indigenous Peoples etc. deliverables prepared by the DED Consultant fully comply with the Asian Development Bank (ADB) Environmental and Social Framework (ESF 2024), Pakistan's environmental and social regulations, and good international industry practice (GIIP).

37. The Consultant shall independently update all safeguard documents and assessments to ensure their adequacy, accuracy, and readiness for ADB appraisal. The responsibility for the final due diligence documents as per ESF 2024 rests with the consultant under this project. Any additional surveys, etc. required shall be carried out by the DED-Consultant on direction of the client, however the responsibility to carry out field verification and update of the documents remains with the consultant.
38. The Consultant shall verify the integration of safeguard mitigation measures into the engineering design and procurement documents. The scope of the safeguards review includes but is not limited to the following:
- (a) **Environmental & Social Baseline Surveys (Review + Gap Filling):** The Consultant shall critically review all environmental and social baseline surveys completed by the DED Consultant. Where gaps exist, the consultant shall identify and prepare report with detailed justification for submission to client. The client will evaluate and direct the DED consultant to carry out the required surveys/field work and submit data to the consultant. The final responsibility of compilation and documentation as per ESF 2024 requirements will be with the consultant. The consultant shall:
 - (i) **Environmental Baseline:** Review and update DED's baseline data for air quality, noise, vibration, water resources, ecology and biodiversity, soil contamination, and cultural heritage. Verify all modeling assumptions (noise, vibration, emissions, hydrology) and update them where required.
 - (ii) **Social Baseline:** Review and validate asset inventories, socio-economic surveys, census data and consultation records. Reassess market valuations and replacement cost assessments if outdated or insufficient.
 - (b) **Environmental, Health, Safety Compliance:** The Consultant shall confirm compliance of the DED with national laws, and ESF 2024. Where non-compliance is identified, the Consultant shall update designs, specifications, and mitigation measures. The key tasks include:
 - (i) Verify incorporation of CRVA recommendations (flood, heat, seismic resilience) into structural and drainage design.
 - (ii) Confirm universal accessibility (UNCRPD/ESF 2024) in stations, depots, and public areas.
 - (iii) Review and update Safety-in-Design provisions for both construction and operation phases.
 - (iv) Ensure environmental and OHS mitigation measures are reflected in BOQs, drawings, and technical specifications.
 - (v) Review structural adequacy against seismic standards and update where needed.
 - (c) **Review & Completion of Environmental & Social Safeguards Documents:** The DED consultant's drafts shall be fully reviewed and updated by the Consultant. Where documents are missing, the Consultant shall prepare all required ESF-compliant deliverables. The table below outlines the responsibilities and outputs of the DED-Consultants. However, the Consultant shall be responsible for the review, update and finalization of all documents listed in addition to the other documents required to ensure full compliance with ESF 2024.

Table 1: Environmental and Social Safeguards Documents

PR/QCBS/CONS-01: Consultancy Services for Design Review, Institutional Strengthening, and PPP / Commercialization for the ML-1 Karachi - Rohri (480 Km) Upgradation Project [Selection 218892]
 [Contract for Consultant's Services - Page 51 of 175]

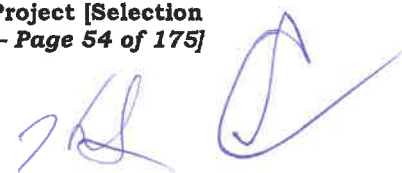
Task Area	Responsibilities	Deliverables
Environmental Safeguards	ADB prepares Environmental and Social Risk Classification Form (ESRC) .	ESRC form is prepared and updated by ADB.
	Prepare Environmental and Social Impact Assessment (ESIA) addressing all direct, indirect, cumulative impacts: physical (air, water, soil, noise, vibration), ecological, socio-economic, and cultural heritage aspects. The assessment shall incorporate quantitative assessments such as modelling for noise, vibration, air quality, and GHGs.	ESIA report per ADB ESF 2024.
	Compare alternatives (alignment, construction methods, technology) and justify preferred option including "no project" scenario.	Alternatives analysis chapter in ESIA.
	Develop Environmental and Social Management Plan (ESMP) with mitigation, monitoring, and reporting measures; integrate into tender documents.	ESMP and integration notes for bidding documents.
	Assess environmental management capacity of EA/IA and propose institutional strengthening and training.	Capacity assessment & training plan.
	Estimate GHG emissions for baseline and project scenarios (diesel vs. electrified operations).	GHG emissions report.
	Conduct air-quality and noise-level surveys (≥10 locations per major urban area, ≥12 hours each).	Field survey report with datasets.
Climate Change Assessment (CCA)	Review climate data, hazards, and projections (2030, 2045) for corridors. Assess vulnerability of rail infrastructure to flooding, heat, storms, etc.	Climate Vulnerability & Risk Assessment report.
	Recommend adaptation measures (design changes, materials) and cost estimates.	Adaptation plan with costing.
	Identify need for additional hydromet stations and monitoring systems.	Hydromet network enhancement proposal.
Social Safeguards	Conduct Social Due Diligence Report (SDDR) identifying legacy issues (compensation, encroachments).	SDDR with findings and recommendations.
	Develop Corrective Action Plan (CAP) for outstanding LAR issues.	CAP with timelines.

Task Area	Responsibilities	Deliverables
	Prepare contract package specific Land Acquisition Plan (LARP) or Land Use Restriction Plan for ROW and additional impacts.	LARP or LURP report.
	Engage accredited valuers to conduct Independent Valuation Study (IVS) ensuring replacement cost compliance.	IVS report with proposed rates.
	Document negotiated settlements ensuring compliance with ADB ESF ESS5.	Negotiated settlement report.
	Coordinate with district administration for land notifications and fund allocations.	Meeting records & action tracker.
	Develop project-level Grievance Redress Mechanism (GRM) covering land, livelihood, SEAH, and environmental issues.	GRM procedures & forms.
	Identify vulnerable groups and propose targeted assistance.	Vulnerability assessment annex.
	Prepare Labor Management Plan (LMP) covering OHS and labor standards compliance.	LMP document.
	Carry out proactive engagement with affected communities, disadvantaged or vulnerable groups, and other stakeholders; disclose relevant information in an accessible manner; and document all consultations in the ESIA.	SEP and consultation records.
Gender Assessment & Action Plan	Conduct socio-economic and gender analysis of communities along corridor.	Poverty, Social & Gender Analysis Report.
	Assess gender mainstreaming capacity of Pakistan Railways & implementing agencies.	Gender capacity assessment.
	Prepare Gender Assessment & Action Plan (GAAP) with measurable indicators.	GAAP in ADB format.

39. The consultant tasks related to above shall include but are not limited to:

- (i) ESIA: Review and update of impact assessments of direct, indirect, induced, and cumulative impacts carrying out additional modeling (air, noise, vibration, hydrological) as needed. Ensure that a meaningful analysis of project alternatives is included; if absent or insufficient, the Consultant shall prepare or strengthen it accordingly.

- (ii) **ESMP:** Verify that all mitigation measures are specific, achievable, costed, measurable and time-bound, and that they are fully integrated into the project's design, technical specifications, and BOQs. Review the ESMP for full alignment with ESF 2024, ensuring it includes clear monitoring indicators, defined responsibilities, capacity-building needs, emergency preparedness, contractor management measures, grievance redress arrangements, and provisions for disadvantaged or vulnerable groups. Integrate construction and operational phase HSE measures.
 - (iii) **LAP / LURP:** Review and update LAP/LURP to reflect optimized DED and ROW. Where DED lacks updated Detailed Measurement Survey or cadastral comparison, the consultant shall identify and prepare report with detailed justification for submission to client. The client will evaluate and direct the DED consultant to carry out the required surveys/field work and submit data to Review consultant (the consultant). The final responsibility of compilation and documentation as per ESF 2024 requirements will be with the consultant.
 - (iv) The consultant shall update compensation tables, impact categories, livelihood restoration, and grievance redress. Prepare Social Due Diligence Reports where required.
 - (v) **SEP, LMP & GRM:** Review adequacy of stakeholder engagement, Labor Management Plan and grievance mechanisms. Conduct additional inclusive consultations, especially with women, vulnerable groups, and document all engagements in ESF 2024-compliant format.
 - (vi) Review and update poverty, social and gender analysis report, gender capacity assessment and update Gender Assessment and Action Plan (GAAP) with measurable indicators.
- (d) **Climate Risk & Vulnerability Assessment (CRVA) and Adaptation Integration:** The Consultant shall ensure all CRVA recommendations are integrated into engineering design. Where CRVA is incomplete or missing, the consultant shall prepare the CRVA. The consultant tasks include but not limited to:
- (a) Update or prepare climate scenarios ("best estimate" and "high case") using the latest regional models.
 - (b) Reassess drainage, embankment, bridge, culvert, and material design for climate resilience.
 - (c) Verify heat-resistant rail materials, cooling/ventilation of technical rooms, and flood protection levels.
 - (d) Prepare/update the CRVA Report and ensure adaptation measures are costed and included in BOQs.
- (e) **Gender and Social Inclusion (GESI) Compliance:** The Consultant shall **verify** integration of the Gender Action Plan (GAP). Where missing, it must be fully prepared and aligned to ESF 2024. The consultant tasks include but are not limited to:
- (i) Assess design for women's safety (lighting, CCTV, security zones, sightlines).
 - (ii) Review facilities for women, elderly, children, and PWDs (ramps, tactile paving, elevators, toilets, lactation rooms).
 - (iii) Ensure designated safe spaces for female vendors and micro-entrepreneurs.
 - (iv) Collect and analyze sex-disaggregated data across all social surveys.



- (v) Gender Action Plan (GAP) Integration: Audit the design against the GAP and ADB's gender mainstreaming categories.
- (f) **Health & Safety (Construction and Operational Phases):** The Consultant shall review and update all HSE plans developed by DED Consultant. Where such plans are missing, the consultant shall prepare them. The H&S requirements during construction and operation phase include but not limited to:
- (i) **Construction Phase:** Verify Safety-in-Design elements and construction sequencing near live traffic/operational railway. Review temporary works design, drainage provisions, worker access, and emergency procedures.
 - (ii) **Operational Phase:** Validate compliance with fire safety, emergency evacuation, crowd management, maintenance access, and station/platform safety. Review depot and yard safety design (ventilation, hazardous materials storage, worker safety systems).
- (g) **Poverty and Social Assessment (PSA):** Where PSA documents exist, review them; where missing, prepare full PSA in accordance with ESF 2024 and ADB guidance. The consultant tasks include but are not limited to:
- (i) Review/ prepare (i) a poverty and social assessment (PSA); (ii) a consultation and participation plan (CPP), and (iii) a summary poverty reduction and social strategy (SPRSS) for adequacy in accordance with ADB's Handbook on Poverty and Social Analysis: A Working Document², Guidelines for Gender Mainstreaming Categories of ADB Projects³, and Strengthening Participation for Development Results: An Asian Development Bank Guide to Participation⁴;
 - (ii) Identify at-risk groups and propose targeted mitigation and participation strategies.
 - (iii) identify safeguards and non-safeguards social issues relevant to the Project's objectives, scope and operational characteristics, and specify verifiable social development outcomes of the project.
 - (iv) identify and estimate the likely socioeconomic and poverty reduction impacts of the Project.
 - (v) assess local demand for the proposed investments, employment opportunities, child labor, HIV/AIDS and human trafficking, affordability, gender and other social risks that would result from the Project and include measures to mitigate social impacts, if any. This will be in accordance with ESF 2024. Prepare the Poverty and Social Analysis for the proposed project.
 - (vi) Propose design features and measures for inclusion in the follow-on investments (including the need for any technical assistance) to address gender, labor, HIV, trafficking, and other social parameters identified in the analysis above. Special attention to be paid to the gender to mainstream

² ADB. 2012 Handbook on Poverty and Social Analysis: A Working Document. Manila
<https://www.adb.org/documents/handbook-poverty-and-social-analysis-working-document>

³ ADB. 2025 Guidelines for Gender Mainstreaming Categories of ADB Projects. Manila
<https://www.adb.org/documents/guidelines-gender-mainstreaming-categories-adb-projects>

⁴ ADB. 2012 Strengthening Participation for Development Results: An Asian Development Bank Guide to Participation. Manila.
<https://www.adb.org/documents/strengthening-participation-development-results-asian-development-bank-guide>

- the concept into project and its design; ensuring station designs provide safe and designated spaces for female vendors and entrepreneurs.
- (vii) conduct and keep records of stakeholder consultations with key stakeholder groups in terms of social and economic characteristics (gender, ethnic and indigenous minorities; socioeconomic vulnerability, etc.) who would be directly and indirectly affected by the Project's objectives and scope, design alternatives, likely positive and negative impacts, possible measures to mitigate adverse impacts and other information that would be of use to the stakeholders;
 - (viii) With the participation of stakeholders, identify and analyze the reasons behind the vulnerability of at-risk groups, including their exposure to risks. Suggest participatory development strategies for key stakeholders to apply when designing and implementing the Project.
 - (ix) collect sex-disaggregated data during poverty and social assessment for all applicable indicators. Focus on how women may have different use or needs when traveling by rail, and on issues of safe transport. Prepare/ Review and validate the Project-specific a Project-specific Gender Action Plan (GAP). Identify project design elements (policy or implementation) in which women can participate in and thus benefit from the project. The GAP shall be prepared, in consultation with the Client, with a proposed timeline reflecting the annual activities and deliverables.
 - (x) Review/ prepare Summary Poverty Reduction and Social Strategy (SPRSS) in accordance with ADB's format.
- (h) **Review of Utility Crossings Deliverables:** Review Utility Asset Inventory prepared by the DED Consultant for completeness. The consultant shall:
- (i) Review Utility Protection/Relocation Plan for engineering adequacy along with proposed cost estimation and agencies/department charge/ fees etc.
 - (ii) Verify constructability of protection/relocation designs.
 - (iii) Ensure designs maintain uninterrupted service during construction.
 - (iv) Assist the Client in coordination with all relevant utility agencies for approval of design and relocation plan.
 - (v) The consultant shall also provide technical assistance to client during relocation of the planned utilities within its assignment period.
- (i) **Land Acquisition and Land Use Restriction Planning (LAP and LURP) – Review & Update:** The Consultant shall conduct a critical review of the Land Acquisition Plan (LAP) /Land Use Restriction Plan (LURP), its integration into the DED and indigenous people's assessment and due diligence in accordance with ADB's ESF 2024:
- (i) implement the additional social surveys through DED-Consultants, agreed upon with the Client.
 - (ii) Review and verify that the DED and ROW have been optimized to avoid and minimize physical and economic displacement.
 - (iii) assess the completeness, adequacy and accuracy of screened and assessed impacts from land acquisition and/or land use restriction linked to all designed improvements and validate that inventories of affected assets and census of project affected persons are compiled adequately and separately for all contract packages involving land acquisition and land use restriction.



- (iv) identify any discrepancies, omissions, inconsistencies, and additional investigations needed for addressing noted anomalies and shall prepare and communicate to the client written observations, justifications, and required additional social impact assessment surveys and corrective measures for preparing implementation ready LAP/LURPs fully compliant with ESF-2024 requirements. The additional surveys as required to update the documents will be carried out by the DED-Consultant, the consultant shall not cost these surveys as part of his proposal.
- (v) for ensuring preparation and delivery of contract package specific implementation ready land acquisition plan (LAP) and/or land use restriction plan (LURP) to address involuntary resettlement impact separately for contract packages involving land acquisition beyond Railway owned ROW and the contract packages involving land use restriction within the Railway owned ROW, the consultant in coordination with the DED consultant shall:
- review and confirm that ROW markers for land to be acquired beyond Railway owned ROW have been installed and construction limits for clearing the assets encroached within the existing ROW limits were marked before commencing the impact assessment surveys.
 - confirm that the defined Corridor of Impact (COI) used/to be used for assessing land to be acquired and conducting detailed measurement, census and socio-economic surveys for preparation of the LAP/LURP is according to detailed design. This defined COI should also be based on the conclusion of actual and potential impacts defined by the environmental assessment reports; Review the status of publication of mandatory land acquisition notification under LAA 1894 for contract packages involving acquisition of additional ROW land beyond Railway owned ROW limits and assist the client in following up with the district land acquisition authorities for publication of section 4 and 5 notifications under LAA 1894;
 - review of cadastral documents for the Project and ensure comparison of actual Detailed Measurement Survey (DMS) and cadastral data to confirm consistency and identification of the deviations in the cadastral maps (if any) and provision of the consultation on possible solutions for such cases with needed respective plan (layout) for correction of each property; review and confirm that the compiled inventory of losses including census data and collected all documents of Affected Persons and their affected assets required for LAP and/or LURP preparation are consistent with the outlined provision in relevant ESS-5 of the ESF-2024;
 - in case of noted discrepancies, share written observation to Client and coordinate with DED consultants for conducting additional impact assessment surveys to finalize the impact inventory and census data required for delivery of implementation ready final LAP/LURP for each contract package separately; preview and verify that all land acquisition and applicable compensation costs for documented losses due to land acquisition or land use restriction are accurately reflected in the cost estimates provided in the itemized budget of contract specific LAP/LURP and the PC-1 and BOQs.
 - review and validate that the institutional set-up for social safeguards management, LAP/LURP preparation, implementation, monitoring and



- evaluation are in place and LAP/LURP implementation schedule is aligned with the construction scheduled, review the Grievance Redress Systems of the EA/IA and assist the EA/IA for establishing a gender inclusive Grievance Mechanism for the project and develop procedures and protocols registering, review and redressing the project related grievances;
- review the stakeholder engagement plan (SEP) and records of meaningful public consultations and information disclosed to the affected communities and other stakeholders by the DED Consultant and in accordance with stakeholders engagement plan (SEP), suggest measures for future consultation and information disclosure measure for the project affected persons, local communities., CSOs and other stakeholders in accordance with SEP agreed by ADB and the Client. Assist the Client in developing the mechanism and needed templates to ensure all the consultations should be documented in detail, including all issues raised and measures proposed to address issues raised; develop a database with all the collected information and assist the Client in review and acceptance of contract package specific implementation ready final LAP/LURP before submission to ADB and support the client to respond the ADB's review comments on LAP/LURP.
 - Based on completed review, prepare a Social Due Diligence Report confirming completeness of assessment of social risks and impacts carried out to deliver contract package specific implementation ready LAP/LURP and assist the ADB project team in preparation of E&S risk screening and categorization forms accordingly
- (j) **Climate Risk & Vulnerability Assessment (CRVA):** The Consultant shall carry out the following as part of the climate assessment review and update:
- (i) Review key climate parameters relevant for the study, focusing on those applicable to the primary climate hazards of the Project.
 - (ii) Review and where missing collect and analyze information related to climate change impacts (environmental, economic, and social impacts) and projections (projected changes in temperature and precipitation) in the Project area.
 - (iii) Review and where missing collate baseline (historical) levels of key parameters including variables especially relevant to the project area and design, and associated hazards.
 - (iv) Review and develop simplified "best estimate" and "high case" scenarios for the key parameters and associated hazards under climate change for the lifetime of the project, using most current and relevant regional climate projections available. If no data from climate models is available use simple climate models such as "Climate 1-Stop" (<http://arcserver4.iagt.org/climate1stop/>) to make climate projections.
 - (v) Review and assess the risks posed by climate change to the Project viability, as well as the vulnerabilities of the Project and the associated risks to the structural components of the project under these scenarios, including implications for performance and operation.
 - (vi) Review and Assess climate change risks for the Project and verify the incorporation of recommended adaptation measures in the engineering design (e.g., climate-adjusted drainage design, heat-tolerant rail steel);

assess climate change risks for the Project in consultation with the Client and ADB, and recommendations for adaptation measures in the engineering design.

- (vii) Review/ prepare Climate Risk and Vulnerability Assessment (CRVA) report.
 - (viii) identify and assess the feasibility of proposed climate adaptation options appropriate to Project conditions and design objectives, including structural and non-structural approaches and interventions, along with estimations of monetary benefits where feasible. This includes an assessment of adaptation finance required.
- (k) **Final ESF 2024 Compliance Output:** The Consultant shall ensure that all safeguards and due diligence deliverables including ESIA, ESMP, CRVA, LAP/LURP, SDDR, PSA, GAP, SEP, GRM, LMP/HSE, and Indigenous Peoples Plan where applicable are fully compliant with ADB ESF 2024, national regulations, and GIIP. Where the Detailed Design Consultant has not addressed any requirements, the Consultant shall prepare detailed report with justification for submission to the client. The Client after evaluation will direct the DED-consultant to carry out additional surveys and field investigations. The Consultant shall review, update, finalize, and provide all safeguards and due diligence documents, ensuring completeness, accuracy, and integration with the design and procurement documents, ready for ADB appraisal.

E.4 Scope of Engineering Design Review and Value Engineering:

General Requirements

40. Design Basis Report Review

- (i) The Consultant shall verify the standards utilized for design, ensuring compliance with relevant Pakistan Railways standards, applicable national codes (PSQCA), and/or relevant international railway standards (Chinese Standards, UIC, AREMA, ASTM, AASHTO, BS, etc.)
- (ii) Where the Design Consultant has deviated from applicable relevant standard, the Consultant shall provide in tabular form the differences and implications for the Client's review.
- (iii) The Consultant shall verify key design parameters against the approved Design Basis Report (DBR).
- (iv) The Consultant shall formally report any non-compliance or deviations from the agreed standards and parameters in writing to client for further rectification through DED-Consultant.
- (v) **Confirm Project Concept and Packages:** Based on its initial understanding of the Project, the Consultant reviews and confirms the Project concept or recommends modifications including optimizations, changes, and alternatives. The Consultant shall also propose appropriate packaging of the Project with its reasoning in consultation with client. The consultant shall in coordination with the client, check all operational constraints, project overall implementation timeline and other factors while finalizing the project packaging. The consultant shall assist client on need basis to provide recommendation on project packages and construction methodology as requested by the client.

41. Coordination and Liaison Committee (CLC):

- (i) A Coordination & Liaison Committee (CLC) shall be notified by the Client, comprising:
 - Focal person from Project Implementation Unit (PIU) (Chair)
 - Focal person from Detailed Engineering Design Consultant (DED-Consultant)
 - Focal person from Review Consultant (RC)- (The Consultant)
- (ii) The CLC will coordinate, supervise, and oversee all activities related to design review, design updates, BOQ revisions, cost updates, and preparation of procurement documents.
- (iii) CLC will establish communication protocols, document exchange mechanisms, and response timelines among all parties.
- (iv) CLC will approve the review methodology, sequencing, and workflow proposed by the Consultant.
- (v) CLC will decide on the first set of documents to be shared for review and agree on the starting priority tasks.
- (vi) CLC will develop and approve a Joint Review Work Plan with clear timelines for all deliverables.
- (vii) CLC will hold regular coordination meetings (weekly/bi-weekly) with formal minutes.
- (viii) CLC will ensure all updates are aligned with ADB procurement guidelines and timelines.
- (ix) CLC will identify and resolve any technical disagreements between the consultant and DED Consultant through agreed procedures. However, in case of dispute, the matter shall be referred to Client for decision.
- (x) CLC will maintain a centralized document control and tracking system for comments, updates, and submissions.
- (xi) CLC shall finalize and approve priority procurement packages for early tendering.
- (xii) The consultant shall comply with all CLC decisions and incorporate required revisions within agreed timelines.
- (xiii) Any other issues cropped up during the review process.

42. Constructability and Risk Analysis

- (i) The Consultant shall critically review the Design work from a construction perspective to ensure it is practical, safe, and efficient to build.
- (ii) The scope of the constructability and risk analysis is set out as follows.
- (iii) The Consultant shall:
 - (a) Identify technical interfaces between design disciplines and ensure they are managed.
 - (b) Incorporate measures identified for risk mitigation from the constructability and risk analysis into the design recommendations. This also include the operational constraints.
 - (c) Develop in detail the implementation plan for existing infrastructure/ utilities relocation.
 - (d) Develop drawings for the implementation of the traffic management plan;
 - (e) Develop construction method statements and identify temporary works requirements according to the site conditions and operational constraints. Construction methodology shall also be developed with a view to organizing construction activities under running train operations, in consultation with the Client, to ensure minimum possible disruption to existing train operations.

- (f) Develop construction methods according to the site conditions (geology, hydrogeology, environment, adjacent structures and accessibility) taking into consideration of appropriate technology, code of practice, safety, impact on adjacent structures, roads, traffic and environment, noise and vibration;
 - (g) Assess the feasibility of rerouting passenger and freight traffic over alternative corridors (ML-2 and ML-3) during ML-1 construction and possession periods, including capacity checks, operational constraints, and required temporary adjustments to ensure service continuity.
 - (h) Develop requirements for labor safety and traffic safety during Project construction, considering working near live railway traffic; and
 - (i) Ensure that the design enables safe methods of operation and maintenance.
- (iv) The Consultant shall consider and respond to any request made by the client related to design update, any document/working paper, presentation etc. required by client at any stage during the contract period.

43. Structured Review and Comment Management

- (i) **Standardized Review Templates:** Develop and utilize standardized comment sheets/templates for providing structured, clear, and actionable feedback on each deliverable received from the Design Consultant. Templates shall categorize comments by discipline, severity (e.g., critical, major, minor), and type (e.g., technical, safety, safeguard, clarity).
- (ii) **Master Issues Log:** Establish and maintain a centralized Master Issues Log (MIL) to track every comment, query, and finding from inception to resolution.

44. Periodic Reporting

- (a) **Monthly Progress Reports:** Submit comprehensive monthly reports to the EA and ADB by the 5th of each month, detailing:
- (b) **Special Reports:** Submit immediate reports on any critical issues that could significantly impact project cost, schedule, or quality.

45. Formal Certification Letter:

Upon satisfactory completion of the review, update and resolution of all critical and major issues, issue a formal Certificate of Compliance and Readiness to the client and ADB. This signed and stamped certificate shall state that:

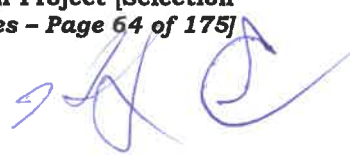
- (a) The DED for the Karachi-Rohri section has been independently reviewed and vetted and optimized.
 - (b) The design is technically sound, structurally adequate, and compliant with all applicable standards and the DBR.
 - (c) Environmental and social safeguard requirements have been adequately integrated into the design and procurement documents.
 - (d) The procurement package (BOQs, Specifications, Bidding Documents) is complete, accurate, and compliant with ADB requirements.
 - (e) All detailed design drawings are fully completed and updated and ready for construction. The drawings shall be construction ready drawings.
 - (f) The overall package is deemed fit for issuance for international competitive bidding.
46. The Consultant shall serve as the independent technical reviewer of the Detailed Engineering Design (DED) Consultant's outputs for the Karachi-Rohri ML-1 Upgradation Project. The Consultant's scope includes a comprehensive review, verification, and gap analysis of all design elements to ensure full compliance with the Approved Preliminary Design (OPD & APD), DBR, Pakistan Railways standards,

- international best practices, constructability requirements, operational functionality, and safety performance.
47. Any identified deficiency, inconsistency, or omission in the DED Consultant's work shall be formally communicated to the Client and the DED Consultant in writing, supported by appropriate technical justification. However, if required to meet project timelines, the Client may direct the Consultant to undertake the necessary corrective reviews, analyses, or supplementary design tasks. Such instructions shall be binding on the Consultant, who must carry out the required work accordingly.
 48. In addition to reviewing the DED deliverables, the Consultant shall actively propose revisions, alternative layouts, and value-engineering solutions wherever improvements in efficiency, cost-effectiveness, durability, or ease of operation and maintenance can be achieved.
 49. Review the availability, adequacy, and condition of Pakistan Railways' construction and maintenance equipment / new equipment (e.g., work-train locomotives, rolling stock, track machinery, mechanized maintenance equipment), identify gaps, and recommend required procurement of new equipment in future with implementation roadmap.
 50. Develop a comprehensive and integrated Testing and Commissioning framework, covering the full lifecycle from factory and site testing through to trial operations and final acceptance (clear definition of testing stages, roles and responsibilities, interface testing, safety certification, acceptance criteria, and phased commissioning up to 160 km/h). In addition, the consultants shall assess and strengthen institutional capacity and readiness of the Implementing Agency and Operator for the Testing and Commissioning phase, including governance arrangements, workflows, and targeted training.
 51. Assess port-rail intermodal connectivity requirements, including current and projected freight flows, yard and terminal capacity, track access arrangements, and necessary infrastructure or operational improvements to ensure seamless integration between ML-1 and major ports. The consultant is required to evaluate the existing rail connections with different seaports as well as the dry ports and shall propose measures to maximize railway traffic. The consultant shall propose viable intermodal facilities / projects to increase railway share in the freight sector. The consultant shall also assess the loading / unloading facilities at the existing ports and suggest improvements by integrating railway system in the design of existing bulk terminals etc. The consultant may propose new / additional berthing facilities, ports, terminals, links or loading / unloading stations to enhance railway's freight traffic. The consultant shall prepare preliminary design / drawings of the proposed railway facilities, and concept design of other proposals.
 52. The PRF Consultant is responsible for developing optimized design alternatives, conducting necessary analytical checks, and providing detailed explanations for all proposed modifications. The final output of this assignment shall include a corrected, verified, and optimized version of the Detailed Engineering Design comprising updated construction ready drawings, specifications, calculations, design reports, and recommendations suitable for approval, tendering, and implementation. The scope of the independent Review, Vetting, and Value Engineering (RVE) of the Detailed Engineering Design includes but is not limited to, as mentioned in the subsequent paras of the document.
 53. **Comprehensive Review and Vetting of Detailed Design:** The Consultant shall conduct a thorough review of the Detailed Engineering Design (DED) for the Karachi-Rohri section (480 km), including but not limited to:



- (a) **Design Basis Report (DBR):** Verify consistency and adequacy of codes, standards, and design parameters in line with the requirements of the DED consultant TOR and detailed design requirements.
- (b) **Alignment & Track Design:** Review horizontal and vertical geometry, gradient profiles, rail type, sleeper design, fastening systems, ballast specification, turnout design, and integration with existing infrastructure.
- (c) **Track Maintenance:** Conduct a comprehensive gap analysis of the proposed track maintenance framework, including organization structure, staffing plans, maintenance depots, workshops, tools, plant and machinery, maintenance vehicles, and define training programs. Recommend value engineering measures and operational efficiency improvements. The Consultant shall evaluate and compare alternative maintenance models, including public sector delivery, hybrid models, and private sector outsourcing and assess international and regional best practices in maintenance reforms. All assessments and recommendations shall be aligned with the requirements of Outputs 2 and 3 of this TOR. The consultant shall then recommend the most suitable maintenance model as well as updated associated design, staffing plan etc.
- (d) **Embankment / Subgrade / Protection Works:** Assess slope stability, cut/fill optimization, hydrological calculations, culvert sizing, erosion control, and climate resilience. Review detailed design of embankments, subgrade, drainage, slope stability, and utility integration. Identify gaps, including fencing and protection works.
- (e) **Bridges and Culverts:** The consultant shall review structural design reports, drawings, and BOQs. Ensure alignment with DED-Consultant deliverables, safety, and constructability standards. The consultant shall also do the gap analysis and apply value engineering for design optimization.
- (f) **Buildings, Sheds, and Other Structures:** The consultant shall verify architectural, structural, and MEP designs for stations, staff quarters, inspection sheds, utilities, and platforms. Ensure functional compliance and alignment with DED outputs, requirements and deliverables. The consultant shall also do the gap analysis and apply value engineering for design optimization.
- (g) **Track in Station Yards:** The consultant shall review line capacity analysis, yard layouts, and arrangement of platform lines, sidings, and maintenance spurs. The consultant shall suggest improvements for operational efficiency and safety.
- (h) **Level Crossings and Grade Separations:** The consultant shall review detailed engineering designs, pedestrian/cyclist facilities, and grade separations. The consultant shall also do the gap analysis and apply value engineering for design optimization.
- (i) **Water Supply and Drainage at Stations and other buildings:** Verify layouts, trenching, pipe sizing, longitudinal and cross-section designs, and disposal arrangements. The consultant shall also do the gap analysis and apply value engineering for design optimization.
- (j) **Locomotive, Rolling Stock, and Maintenance Facilities:** The consultant shall review design basis, modernization proposals, and phased integration plans. The consultant shall recommend improvements for operational efficiency and safety compliance.
- (k) **Signaling and Interlocking System:** The consultant shall review detailed system design, interlocking schematics, SIL-4 compliance, power supply, system integration, and control center design. The consultant shall recommend improvements for operational efficiency and safety compliance.

- (l) **Telecommunication:** Review network design, OFC and LTE-R systems, and monitoring/control systems. Provide recommendations for operational reliability and interoperability.
- (m) **Electric Power System:** The consultant shall verify design and integration of power supply, distribution, lighting, protection, and renewable energy components.
- (n) **Electric Traction:** The consultant shall review spatial provisions, OHE clearances, and provisions for future electrification infrastructure. The consultant shall Consider including lateral clearance on bridges, and interface provisions for signals, cable routing, and drainage to facilitate future catenary installation with minimal disruption.
- (o) **Walton Academy Scope:** The consultant shall review design of academic blocks, training facilities, and MEP integration. The consultants shall carry out detailed gap analysis for training framework, operational policies, and long-term sustainability measures.
- (p) **Safety Enhancements:** The Consultant shall assess whether the DED adequately incorporates essential safety provisions for maintenance personnel and passengers. This includes verifying the provision of safe access for maintenance staff, such as marked walkways, protected track crossings, and designated refuge areas, and evaluating passenger safety measures at stations, including platform edge protection and safe inter-platform movement. The Consultant shall also review the need for security fencing or controlled barriers along the ROW, particularly in sensitive locations, to prevent unauthorized access by people or animals. Recommendations for improvements or additions should be clearly documented as part of the design.
- (q) Existing railway rulebooks, manuals, and operating documentation include inherent procedural and regulatory bottlenecks that may adversely affect the safety and efficiency of train operations, which is essential for meeting the overarching objectives of this assignment. The Consultant shall undertake a comprehensive analysis of these bottlenecks and provide detailed recommendations, including proposed amendments or reforms, for consideration by the Client.
- (r) **Bidding Documents:** The consultant shall review BOQs, construction ready drawings, bid documents, technical specifications, updated cost estimates, and safeguard plans. The consultant shall ensure alignment with DED-Consultant outputs, ADB procurement guidelines etc. The consultant shall update the BOQs, Tender and Construction Drawings, Bidding Documents, technical specifications to meet the requirements of ADB standard bidding documents and ADB Procurement Policy.
- (s) **Supplementary Design:** The consultant shall function as the independent technical assurance entity for all Supplementary Designs, and Detailed Engineering Design (DED) deliverables under the ML-1 project. The consultant will verify compliance with the Approved Preliminary Design (APD), Original Preliminary Design (OPD), Pakistan Railways standards, and applicable international practices. The scope includes multidisciplinary review, confirmation of design completeness and accuracy, identification of gaps and risks, and application of engineering solutions to ensure tender readiness. The consultant provide clear, time-bound recommendations to optimize constructability, operational efficiency, safety, maintainability, and integration across all design packages.



54. The Next section outlines the detailed requirements of detailed design review, vetting and value Engineering. The consultant shall independently review, verify, and technically vet all Detailed Engineering Design (DED) outputs related to the ML-1 alignment. In addition to reviewing designs, the Consultant may also propose revised layouts, alternative solutions, and value-engineering options wherever efficiency, safety, or lifecycle performance can be improved. Any gaps, errors, inconsistencies, or omissions identified in the DED shall be formally communicated to the Client and DED Consultant with technical justification. Upon the Client's instruction, the Consultant shall directly carry out missing analyses, redesign, correction, or optimization work to maintain project timelines. The final output will be a verified, corrected, and optimized detailed engineering design for all components mentioned above.

Detailed Requirements

(I) Alignment.

1. **Horizontal Alignment:** Review minimum curve radii, transition curve lengths, and their compliance with the specified design speeds (120/160 km/h). Check for unnecessary deviations and optimization potential. The consultant shall review the detailed engineering design in line with the requirements of the DED-Consultant TOR, then evaluate design for gap analysis and optimization. The consultant shall develop optimized alignment options through application of value engineering where required. The consultant shall be responsible for finalization of the detailed engineering design of alignment, preparation of construction ready drawings etc.
2. **Vertical Alignment:** Verify gradients, vertical curve lengths, and their suitability for both passenger and heavy freight operations. Ensure adequate sight distances are achieved. The consultant shall review the detailed engineering design in line with the requirements of the DED-Consultant TOR, then evaluate design for gap analysis and optimization. The consultant shall develop optimized alignment options through application of value engineering where required. The consultant shall be responsible for finalization of the detailed engineering design of alignment, preparation of construction ready drawings etc.
3. **Cant and Superelevation:** Scrutinize the calculation and application of cant (superelevation) for curves to ensure safe and comfortable travel, checking for permissible deficiencies and excesses.
4. **Clearance Envelopes:** Confirm that the kinematic envelope for rolling stock is maintained throughout the alignment, especially in tunnels, under bridges, and through stations.

(II) Track Structure Design (Permanent Way):

The detailed requirements include but are not limited to:

- (i) Review DED compliance with APD, DBR, Pakistan Railways standards, and design parameters (160 km/h, 25-ton axle load).
- (ii) Verify adequacy and justification of all track components: rails, sleepers, fastenings, ballast/sub-ballast, blanket layer, subgrade.
- (iii) Review special trackwork: turnouts, crossovers, CWR welding plans, expansion joints, transition zones.
- (iv) Conduct detailed review of PSC sleeper design: structural analysis, fatigue, dynamic loading, reinforcement, prestressing, materials.
- (v) Verify compatibility of sleeper design with existing manufacturing plants and identify required factory adjustments.

- (vi) Assess constructability, maintainability, lifecycle costs, and operational performance.
- (vii) Evaluate safety, reliability, drainage adequacy, and climate-related risks.
- (viii) Identify gaps, inconsistencies, and omissions in DED and provide corrective measures.
- (ix) Develop value-engineering proposals, optimized layouts, and cost-efficient alternatives.
- (x) Ensure that the Detailed Engineering Design (DED) incorporates adequate lateral clearances on viaducts, bridges, and similar structures to accommodate future system upgrades.
- (xi) Review and confirm that civil works include necessary interface provisions for future catenary installation including space and pathways for signals, cable routing, drainage systems, and other system components so electrification can be implemented later with minimal disruption.
- (xii) Verify that the proposed Detailed Engineering Design (DED) adequately addresses track spacing and track gauge requirements, ensuring compatibility with future rolling stock, operational safety, and maintenance needs.
- (xiii) Review and identify any existing obstacles or structures (e.g., station platforms, buildings, utilities, miscellaneous structures) within the upgraded 480 km section that may remain after construction and could encroach on required dynamic or static clearance envelopes.
- (xiv) Assess the feasibility of implementing ballast less track systems in selected high-stress or maintenance-critical locations, such as stations, depots, crossovers, and bridge approaches, where lifecycle benefits may outweigh initial costs.
- (xv) Verify that the turnout types are fully aligned with the required operational speeds, axle loads, and signaling/point machine requirements, ensuring consistent performance and system integration.
- (xvi) Benchmark design practices with regional and international railway systems.
- (xvii) Assess the adequacy of the design to accommodate modern freight operations, including minimum 700-meter train lengths and corresponding loop/siding lengths.
- (xviii) Prepare a coordinated comments matrix and facilitate issue resolution with the DED Consultant.

- (III) **Track Maintenance:** The Consultant shall conduct a detailed technical review, verification, and gap analysis of all Track Maintenance related deliverables submitted by the Detailed Engineering Design (DED) Consultant. The review shall assess compliance with the APD, DBR, Pakistan Railways' maintenance strategy, international good practice for mechanized maintenance, and project operational requirements. The Consultant shall review the proposed Track Maintenance Organization, manpower planning, maintenance facilities, machinery specifications, inspection systems, and maintenance regimes. The Consultant shall evaluate and compare alternative maintenance models, including public sector delivery, hybrid models, and private sector outsourcing and assess the best international and regional practices in maintenance reforms. All assessments and recommendations shall be aligned with the requirements of Outputs 2 and 4 of this TOR. The consultant shall then recommend the most suitable maintenance model as well as updated associated design, staffing plan etc. The detailed task includes but are not limited to following:

- (i) Assess the proposed Track Maintenance Organization Structure, including hierarchy, functional responsibilities, supervision mechanisms, and coordination among TMD, Work Area, and Work Zone.
- (ii) Evaluate the Manpower Planning & Staffing Schedule, including staffing norms per km, personnel qualification requirements, and the balance of technical, supervisory, and support staff.
- (iii) Review Facility Layouts & Infrastructure Requirements, covering depots, workshops, sheds, offices, storage facilities, utilities, and communication systems.
- (iv) Verify the Machinery & Equipment Plan, including specifications, allocation, adequacy, and alignment with mechanized maintenance needs.
- (v) Evaluate the Track Inspection & Monitoring System, including inspection frequencies, technologies used (inspection cars, rail flaw detectors, digital tools), and data accuracy.
- (vi) Define the Mechanized Maintenance Planning & Scheduling Framework, including preventive, corrective, and emergency maintenance procedures and KPIs.
- (vii) Assess the proposed Track Maintenance, including divisional and HQ-level arrangements and zone-wise TM offices.
- (viii) Review the Tools, Plants, and Vehicle Requirements, ensuring adequacy, proper allocation, and suitability for field operations.
- (ix) Evaluate the Training & Capacity Building Plan, including modules for machine operation, safety training, inspections, certifications, and refresher courses.
- (x) Review the Maintenance Data Management & Reporting System, including digital recordkeeping formats, reporting structures, dashboards, and centralized monitoring.
- (xi) Assess the Safety & Quality Management Plan, including field safety procedures, inspection standards, and quality assurance protocols.
- (xii) Verify the Implementation Schedule & Cost Estimates, including phasing, procurement requirements, and investment needs.
- (xiii) Identify any deficiencies, inconsistencies, or gaps, and provide technical recommendations aligned with project objectives and good international practices.
- (xiv) Evaluate and compare alternative maintenance models, including public sector delivery, hybrid approaches, and private-sector outsourcing; assess relevant regional and international best practices in maintenance reforms; and recommend the most suitable maintenance model for Pakistan Railways, along with required updates to design, staffing, tools, depots, machinery, and operational arrangements.
- (xv) Identify any deficiencies, inconsistencies, or gaps in the DED Consultant's proposals and provide technically justified recommendations aligned with Outputs 2 and 3 of this TOR.

(IV) Embankment / Subgrade / Protection Works: The detailed requirements include but are limited to the following:

- (i) Review of Subgrade Geometry & Formation Design: The consultant shall check compliance with APD formation widths, crown slopes, shoulder widths, and curve widening. verify geometric transitions at curves, stations, bridges, and special locations. Identify deviations and recommend corrective or optimized design adjustments.
- (ii) Validate final formation levels against APD, topography, hydrology, and flood constraints. Review ground improvement methods (stabilization, blanketing,



- geogrids, drainage layers). Recommend optimized or alternative solutions where performance or cost efficiency can be improved.
- (iii) Check stability calculations, soil parameters, boundary conditions, and seismic assumptions. Confirm that required safety factors are achieved for all slope conditions. Propose reinforcement/stabilization measures where necessary.
 - (iv) Assess adequacy of catchwater drains, side drains, sub-surface drainage, and erosion control. Review retaining walls, toe walls, gabions, stone pitching, and hydraulic protection works. Ensure proper integration with culverts, bridges, and adjacent civil components.
 - (v) Verify completeness of utility asset inventory and field-verified data. Review proposed protection/relocation methods (ducting, jacking, diversions, shielding). Validate structural and MEP design details, installation methods, and safety provisions. Check coordination with E&S requirements and right-of-way planning.
 - (vi) Review fencing alignment, design criteria, materials, and structural calculations.
 - (vii) Check compliance of metal mesh and RCC fencing with safety and operational needs. Evaluate gate spacing, locking mechanisms, and access control. Confirm interfaces with track, utilities, drainage, signaling, and station areas.
 - (viii) Verify geo-referenced land plans, cadastral overlays, coordinates, and area statements. Identify inconsistencies with alignment, ROW limits, or utility relocation needs. Recommend corrections and updates where required.
 - (ix) Review BOQs and cost estimates for completeness, accuracy, and consistency. Validate specifications and ensure alignment with standards and design intent. Identify missing items or discrepancies impacting readiness.
 - (x) Propose cost-effective or performance-enhancing alternatives for ground improvement, drainage, fencing, and utility relocation. Recommend design simplifications, risk-reduction measures, and construction-friendly solutions. Provide technical comparison and justification for all alternatives.
 - (xi) Prepare structured review comments, gap logs, redlined drawings, and review matrices. Highlight safety risks, non-compliances, or design contradictions requiring rectification. Formally communicate all deficiencies to the Client and DED Consultant with justification.
 - (xii) At Client's request, carry out required design updates to meet project timelines. Update construction drawings, reports, BOQs, and calculations to close gaps or resolve critical issues.
 - (xiii) Submit a consolidated, corrected, and optimized set of construction-ready deliverables, including drawings, reports, specifications, BOQs, and calculations.
- (V) Bridges and Culverts:** The detailed requirements include but are not limited to following:
- (i) Verify completeness and accuracy of the DED Consultant's inventory for all bridges, culverts, ROBs, RRBs, foot-over bridges (FOBs), and other structures across all sections. Evaluate proposed reconstruction, rehabilitation, closure, reuse, or new construction plans and confirm their technical justification.
 - (ii) Validate structural loading assumptions including seismic, hydrological, train-induced dynamic forces, fatigue, and lateral loads.
 - (iii) Independently check the design of superstructure and substructure components including girders, decks, slabs, piers, abutments, wing walls, parapets, and bearings. Confirm adequacy of materials, reinforcement, safety factors, and robustness of design under heavy freight operations. Assess constructability, durability, and long-term maintenance implications.

- (iv) Review methodologies used for determining design discharge, flood levels, scour depth, and waterway adequacy. Verify sizing and layout of culverts and bridge spans, including the appropriateness of drainage systems and water training works. Assess proposed protection works against hill torrents, flooding, and erosion.
- (v) Review soil investigations, geotechnical parameters, and foundation recommendations. Review foundation type selection (shallow, piles, caissons, rafts) and confirm adequacy under design loads and ground conditions. Assess potential settlement, liquefaction, and stability risks.
- (vi) Check condition survey results and NDT (if performed) for accuracy and completeness.
- (vii) Review retrofitting/strengthening proposals for material compatibility, structural adequacy, and extended service life.
- (viii) Verify that rehabilitation measures meet safety and durability requirements.
- (ix) Review of Protection Works and Ancillary Systems
- (x) Evaluate designs for scour protection, retaining walls, slope stabilization, water training structures, flood protection systems, and erosion control measures.
- (xi) Confirm compatibility of protection works with hydrological and geotechnical conditions.
- (xii) Consistency with Alignment, Drainage & Interfacing disciplines
- (xiii) Ensure coordination of structural designs with final alignment, track platform levels, drainage plans, utilities, and roadway interfaces.
- (xiv) Identify and report any conflicts, omissions, or constructability issues.
- (xv) BOQ, Technical Specifications & Drawings
- (xvi) Review construction drawings for accuracy, completeness, and coordination.
- (xvii) Validate BOQ quantities and alignment with design drawings and specifications.
- (xviii) Ensure specifications are technically sound, clear, and aligned with project standards.
- (xix) Identify inconsistencies, errors, omissions, or non-compliance in DED submissions.
- (xx) Provide written comments, supported by technical justification, to both the Client and the DED Consultant.
- (xxi) If requested by the Client, the Review Consultant shall carry out design corrections, alternative assessments, or additional design tasks to avoid delays this requirement shall be binding.

- (VI) Buildings, Stations, Sheds, and Other Structures:** The consultant shall independently review, assess, and verify all architectural, structural, MEP, and auxiliary building designs prepared by the Detailed Engineering Design (DED) Consultant. The objective is to ensure compliance with approved Design Criteria, Pakistan Railways standards, building codes, seismic requirements, and operational needs of railway facilities. The consultant shall identify gaps, inconsistencies, and non-compliance, propose corrective measures, verify constructability and durability, and confirm that all building designs are safe, functional, and cost-effective. The detailed requirements of this task include but are not limited to the following:
- (i) Verify the list of all buildings and ancillary structures proposed by the DED Consultant (stations, equipment rooms, staff quarters, maintenance sheds, rest houses, security structures, platforms/shelters, utilities buildings, control centers etc.). Confirm appropriate classification of buildings (key, operational, service, residential, etc.) per design criteria and seismic requirements.

- (ii) Review architectural layouts for functionality, passenger movement efficiency, staff workflows, accessibility, and compliance with fire safety and building codes. Assess climate-responsive features including insulation, ventilation, daylighting, and thermal efficiency. Check consistency with regional architectural character and railway branding requirements.
 - (iii) Verify adequacy of structural systems (masonry, RCC, steel, composite structures). Independently review structural calculations for foundations, columns, beams, slabs, roofs, frames, and RC/steel elements. Confirm design life criteria (50 years) and suitability of locally available materials. Ensure compliance with seismic fortification requirements: Assess design safety against collapse, excessive deformation, or serviceability issues.
 - (iv) Review soil investigation data and confirm adequacy of foundation type selection (isolated footings, strip footings, raft, or other systems). Verify bearing capacities, settlement assessment, and geotechnical compatibility with structural loads.
 - (v) Review electrical systems including lighting, distribution, grounding, backup systems (solar, generator, UPS), and load estimations.
 - (vi) Verify that power demand includes future signaling and telecommunication needs.
 - (vii) Review plumbing, drainage, sewerage, water supply, and pumping systems for compliance with standards and operational practicality.
 - (viii) Assess HVAC systems for suitability, particularly for data, control, and equipment rooms.
 - (ix) Confirm integration between architectural, structural, and MEP components.
 - (x) Check platform height, width, structural support, drainage, shelters, finishes, and accessibility compliance.
 - (xi) Verify design of boundary walls, security posts, duty huts, and water-supply structures. Confirm ease of construction, maintenance, and operational efficiency of proposed designs. Evaluate material durability, ventilation quality, and protection of sensitive equipment.
 - (xii) Conduct detailed reviews of architectural, structural, and MEP drawings for accuracy, completeness, and coordination. Verify that BOQs correspond with construction drawings and specifications. Identify discrepancies, omissions, or constructability conflicts.
 - (xiii) Station Structures and Platforms: Review refurbishment plans for station buildings and platforms to verify compatibility with the dimensions, envelope, and operational requirements of future rolling stock.
 - (xiv) Verify that stations include adequate toilet facilities, ensuring accessibility, privacy, and gender-segregated options in line with inclusive design standards.
 - (xv) Document all design errors, inconsistencies, or non-compliances and submit formal comments with technical justification to the Client and the DED Consultant.
 - (xvi) On Client request, the Consultant shall perform additional design checks, alternative assessments, or required modifications to maintain the project schedule this requirement shall be binding.
- (VII) Track in Station Yards:** The consultant shall review line capacity analysis, yard layouts, and arrangement of platform lines, sidings, and maintenance spurs. The consultant shall suggest improvements in operational efficiency and safety. The detailed requirements related to this task include but are not limited to the following:
- (i) Verify that station yard redesigns follow APD principles of preserving existing layouts where feasible.
 - (ii) Confirm realignment proposals where track center spacing < 4.725 m and ensure compliance with standard spacing requirements.

- (iii) Review arrival–departure track lengths (≥ 700 m) for medium, small, and large stations and validate justification for any deviations due to site constraints.
 - (iv) Check retention of up/down routing logic and verify operational feasibility of unidirectional and common-use arrival–departure routes.
 - (v) Review treatment of sidings, freight lines, unused tracks, and reconnection proposals; confirm no unnecessary dismantling.
 - (vi) Validate clearance compliance with Pakistan Railways' Schedule of Dimensions for buildings, platforms, and equipment.
 - (vii) Review revisions made where platforms encroach on main line clearance envelopes.
- (VIII) Level Crossings and Grade Separations:** The consultant shall review detailed engineering designs, pedestrian/cyclist facilities, and grade separations. The consultant shall also do the gap analysis and apply value engineering for design optimization.
- (i) Review APD proposals for conversion of level crossings into grade-separated structures and confirm prioritization logic and safety rationale.
 - (ii) Verify classification of retained manned crossings, upgraded manned crossings, and proposed closures.
 - (iii) Assess adequacy of proposed interlocking arrangements, especially for un-manned or upgraded crossings. Review site assessment data including visibility, traffic loads, road geometry, proximity to settlements, and train frequency. Confirm completeness and appropriateness of safety and risk analysis for each crossing.
 - (iv) Identify any missing data, deficiencies, or inconsistencies in site assessments. Assess suitability of APD/DED proposals for grade separation (flyovers, underpasses, pedestrian/bike bridges) or for manned-with-interlocking upgrades. Verify justification for selected upgrade type based on safety, constructability, cost, and operational factors.
 - (v) Recommend revised or alternative upgrade solutions when improvements in safety or efficiency can be achieved.
 - (vi) Review designs for gate lodges, motorized lifting barriers, interlocking systems, communication links, warning devices, crash barriers, and road paving. Confirm integration of crossing upgrades with adjacent yard or station layouts.
 - (vii) Verify Grade separation drawings, structural analysis models, span arrangements, vertical and horizontal clearances, and approach ramp geometry.
 - (viii) Review foundation, substructure, superstructure, drainage, retaining walls, and utility relocation proposals.
 - (ix) Check pedestrian and cyclist facilities for safety, accessibility, barrier protection, and alignment with road/rail standards.
 - (x) Identify design deficiencies or missing structural, geotechnical, or hydrological inputs, constructability, Safety, and Operational Review. Assess constructability of proposed structures with respect to maintaining uninterrupted train operations.
 - (xi) Review traffic diversion, staging, and work-zone safety plans.
 - (xii) Validate proposed construction methodology and phasing for grade separations and upgraded crossings.
 - (xiii) Review layout plans for each crossing and grade separation structure for completeness and geometric accuracy. Review track works, duty hut designs, gate leaves, warning systems, and associated road works. Verify BOQs, material specifications, cost estimates, and utility relocation schemes for accuracy and consistency.

- (xiv) Identify omissions, non-compliances, inconsistencies, or technical gaps in DED documents. Provide written comments with clear technical justification to the Client and DED Consultant.
 - (xv) Recommend corrective actions, redesigns, or alternative solutions to enhance safety, operability, or cost-effectiveness.
 - (xvi) Propose design optimizations, alternative layouts, or more efficient structural/operational solutions were beneficial. Conduct value engineering analyses to improve safety, reduce costs, or increase operational efficiency. Provide revised or optimized designs/drawings when required by the Client to meet project timelines.
 - (xvii) Deliver updated and corrected documentation as part of the Review Consultant's responsibility.
- (IX) Water Supply and Drainage at Stations and other buildings:** Verify layouts, trenching, pipe sizing, longitudinal and cross-section designs, and disposal arrangements. The consultant shall also do the gap analysis and apply value engineering for design optimization. The detailed requirements include but are not limited to:
- (i) Assess water supply system: source selection, storage, pumping, distribution, hydraulic calculations, and quality control.
 - (ii) Confirm water consumption assumptions and future expansion provisions.
 - (iii) Evaluate wastewater collection, treatment, and disposal design.
 - (iv) Check environmental compliance for wastewater discharge and sludge management.
 - (v) Review drainage design: drains, trenches, hydraulic profiles, gradients, flood risks, and stormwater integration.
 - (vi) Assess constructability, O&M, safety features, and system resilience to environmental stresses.
 - (vii) Verify coordination with architecture, MEP systems, utilities, platforms, yards, and track drainage.
 - (viii) Identify inter-disciplinary conflicts and recommend resolutions.
 - (ix) Review all DED documents, drawings, specifications, and BOQs for completeness and accuracy.
 - (x) Prepare Review Report highlighting compliance, gaps, risks, and recommended corrective measures.
 - (xi) Maintain Comment Matrix/Register and track incorporation of all comments.
 - (xii) Review the drawings for water supply, drainage, trenching, profiles, and disposal arrangements.
 - (xiii) Formally notify deficiencies and support Client in resolving issues to ensure design approval.
 - (xiv) Propose design optimizations, alternative options or more efficient structural/operational solutions were beneficial. Conduct value engineering analyses to improve safety, reduce costs, or increase operational efficiency. Provide revised or optimized designs/drawings when required by the Client to meet project timelines.
- (X) Locomotive, Rolling Stock, and Maintenance Facilities:** The consultant shall review design basis, modernization proposals, and phased integration plans. The consultant shall recommend improvements for operational efficiency and safety compliance. The detailed requirements of this task include but are not limited to:

- (i) Review APD design basis, assumptions, and system philosophy; verify DED compliance with APD and execution-level requirements.
 - (ii) Assess existing locomotive depots: distribution, maintenance schedules, routing, technical capacity, and operational efficiency.
 - (iii) Evaluate proposed upgraded locomotive facilities: layouts, allocation plans, workload distribution, and repair cycle adequacy.
 - (iv) Review rolling stock depots for passenger and freight trains: maintenance processes, servicing frequencies, depot sizing, and equipment requirements.
 - (v) Review available maintenance records of track and structures, including track geometry data and areas requiring frequent intervention. Analyze these records in conjunction with proposed upgrading/rehabilitation works in the DED to ensure design decisions address historical performance and maintenance challenges.
 - (vi) Ensure that proposed upgrading and rehabilitation works are optimized to minimize future maintenance requirements and costs. Provide recommendations to Pakistan Railways for improved future maintenance practices, including preventive maintenance strategies, inspection protocols, and infrastructure management approaches. Evaluate design choices from the perspective of long-term operational sustainability and ease of maintenance, ensuring that upgraded facilities and structures are robust, durable, and maintenance friendly.
 - (vii) Conduct value engineering: identify cost, layout, and operational optimization opportunities without compromising safety or performance.
 - (viii) Check constructability, O&M, safety features, accessibility, and resilience of facilities against environmental and operational stresses.
 - (ix) Ensure integration and coordination with station layouts, tracks, yard arrangements, and other civil/MEP systems; resolve inter-disciplinary conflicts.
 - (x) Ensure that the Detailed Engineering Design (DED) and proposed upgrades consider characteristics of future freight and passenger rolling stock, including clearance, axle load, and dynamic effects on civil structures.
 - (xi) Review all DED reports, drawings, specifications, and BOQs for completeness, consistency, and adherence to international railway standards.
 - (xii) Formally notify deficiencies or gaps with technical justification and assist the Client in resolving them for timely approval.
 - (xiii) Deliver Review Report, Comment Matrix, Marked-Up Drawings, Value Engineering recommendations, and Final Consolidated Report confirming readiness for approval.
- (XI) Signaling and Interlocking System:** The consultant shall review detailed system design, interlocking schematics, SIL-4 compliance, power supply, system integration, and control center design. The consultant shall recommend improvements for operational efficiency and safety compliance. The detailed requirements related to this task include but are not limited to:
- (i) Review APD and DED design basis, assumptions, and system philosophy for signaling, interlocking, and train control.
 - (ii) Verify compliance with fail-safe principles, SIL 4 safety requirements, and international railway standards.
 - (iii) Assess Automatic Signaling, Train Control, and ATP systems, including vehicle detection devices (AFTC/Digital Axle Counters) and interlocking layouts.
 - (iv) Review system reliability, redundancy, fault tolerance, and power supply arrangements (UPS and diesel backup) to ensure uninterrupted, safe operations.
 - (v) Conduct value engineering and optimization to improve cost-efficiency, operational performance, and equipment layouts.

- (vi) Evaluate operation, maintenance, and sustainability aspects: ease of inspection, diagnostics, remote monitoring, and future maintenance minimization.
 - (vii) Analyze available existing maintenance data and integrate lessons learned into DED proposals to reduce long-term maintenance costs and improve asset life.
 - (viii) Ensure seamless integration with traction power, telecommunications, rolling stock, and other railway systems; identify and resolve interface conflicts.
 - (ix) Undertake a comprehensive review of the Detailed Design for the signaling, telecommunications, and train control systems, including the applicable technical standards and associated bidding documents, to ensure that the specifications adopt a technology-neutral, performance-based approach, avoid unnecessary technology-specific constraints, and promote open eligibility for international competition.
 - (x) Deliver Review Report, Comment Matrix, Marked-Up Drawings, Value Engineering & O&M recommendations, and Final Consolidated Report confirming design readiness for approval.
- (XII) Telecommunication:** Review network design, OFC and LTE-R systems, and monitoring/control systems. Provide recommendations for operational reliability and interoperability. The detailed requirements of this task include but are not limited to:
- (i) Review APD and DED design basis, assumptions, and system philosophy for telecommunication systems.
 - (ii) Verify compliance with international railway telecom standards, Pakistan Railways requirements, and APD recommendations.
 - (iii) Assess LTE-R, MPLS, OFC (48-core), SDH/STM upgrades, and system redundancy for reliability and interoperability.
 - (iv) Review layout and design of telecom operation centers, exchanges, BTS/BSC, Central Telecom Workshop (CTW), CCTV surveillance systems, and data centers.
 - (v) Evaluate data center design: capacity, redundancy, cooling, power backup, disaster recovery, and integration with NMS and railway operations. If data center design not included in detailed design the consultant shall carry out the data center design along with specification and safety requirements. A Tier III data center will be required.
 - (vi) Evaluate fail-safe design, contingency protocols, fault tolerance, and power backup arrangements for uninterrupted operation.
 - (vii) Conduct value engineering and optimization for cost efficiency, operational performance, and equipment layouts.
 - (viii) Assess operation & maintenance (O&M) aspects, including accessibility, monitoring, maintenance planning, and long-term sustainability.
 - (ix) Ensure integration with signaling, interlocking, rolling stock communications, traction power, and other railway systems; resolve interface conflicts.
 - (x) Review passenger and staff communication systems: Wi-Fi, internet, mobile coverage, bandwidth, and quality of service.
 - (xi) Identify and communicate any shortcomings, gaps, or inconsistencies in the DED; provide recommendations for improvement.
 - (xii) Prepare Review Report, Comment Matrix, Marked-Up Drawings, Value Engineering & O&M recommendations, and Final Consolidated Report confirming design readiness for approval.

- (XIII) Electric Power System:** The consultant shall verify design and integration of power supply, distribution, lighting, protection, and renewable energy components. The detailed requirements of this task involved, but are not limited to:
- (i) Review APD and DED design basis, assumptions, and system philosophy for traction and non-traction power systems.
 - (ii) Verify compliance with international and national electrical standards, Pakistan Railways requirements, and APD recommendations.
 - (iii) Assess design of substations, 11/0.4kV transformers, power feeders, and load distribution networks for stations, yards, workshops, and operational facilities.
 - (iv) Review lighting, control, and protection systems including protective relays, power backup arrangements, and automatic fire alarm integration.
 - (v) Evaluate solar power system design for hybrid or standby operation, integration with existing networks, and compatibility with current installations.
 - (vi) Assess redundancy, fault tolerance, and reliability of power supply systems to ensure uninterrupted operations during grid outages or failures.
 - (vii) Conduct values engineering and optimization for cost efficiency, energy conservation, and operational performance.
 - (viii) Review lightning protection, earthing, and surge protection systems to ensure safety and compliance with IEC 62305 and railway standards.
 - (ix) Evaluate energy efficiency measures, high-efficiency equipment selection, and power consumption optimization.
 - (x) Assess operation & maintenance aspects including accessibility, maintainability, monitoring, and long-term sustainability.
 - (xi) Identify and communicate any shortcomings, gaps, or inconsistencies in the DED; provide recommendations for improvement while noting that responsibility for overall detailed design remains with the DED Consultant.
 - (xii) Prepare Review Report, Comment Matrix, Marked-Up Drawings, Value Engineering & O&M recommendations, and Final Consolidated Report confirming design readiness for approval.
- (XIV) Electric Traction:** The consultant shall review spatial provisions, OHE layouts, clearances, and associated electrification infrastructure. The consultant shall Consider including lateral clearance on bridges, and interface provisions for signals, cable routing, and drainage to facilitate future catenary installation with minimal disruption. The detailed requirements for this task include but are not limited to:
- (i) Review APD and DED provisions for future electric traction along the corridor, ensuring adequate structural and clearance allowances.
 - (ii) Verify that track alignment, elevation, and profile design are compatible with future electrification requirements.
 - (iii) Assess overhead structures (ROBs, FOBs, bridges) for sufficient clearance for both current diesel and future electric operations.
 - (iv) Ensure that viaducts, bridges, culverts, and yards incorporate lateral clearance for future overhead equipment (OHE) installation.
 - (v) Review interface with civil works, including signals, cable routing, drainage systems, and other utilities, to allow seamless future catenary installation.
 - (vi) Verify that buildings, station platforms, and yard layouts provide necessary spatial allowances for electric traction equipment and support structures.
 - (vii) Assess compatibility of proposed structural and geometric designs with future electrification to avoid major reconstruction.

- (viii) Assess the feasibility and technical requirements and provide recommendations for accommodating future double-stack container operations, including overhead equipment (OHE) clearance, where applicable.
 - (ix) Conduct value engineering and optimization to balance current upgrade requirements with future electrification needs.
 - (x) Identify and communicate any shortcomings, gaps, or inconsistencies in DED related to electric traction provisions.
 - (xi) Prepare Review Report, Comment Matrix, and Marked-Up Drawings highlighting compliance, risks, and recommendations for future electrification readiness.
- (XV) Walton Academy Scope: The consultant shall review design of academic blocks, training facilities, and MEP integration. The consultants shall carry out detailed gap analysis for training framework, operational policies, and long-term sustainability measures. The detailed requirements related to this task include but are not limited to:**
- (i) Review APD and DED design basis, assumptions, and system philosophy for the Academy's upgradation.
 - (ii) Verify compliance with relevant building codes, educational standards, environmental regulations, and ML-1 operational requirements.
 - (iii) Assess detailed design of academic and administrative buildings, including classrooms, laboratories, simulation centers, auditoriums, hostels, staff housing, and recreational facilities.
 - (iv) Review structural design: foundations, columns, beams, slabs, retaining walls, water tanks, boundary walls, and all reinforced concrete/steel elements; check calculations, bar bending schedules, and construction drawings.
 - (v) Review Mechanical, Electrical, and Plumbing (MEP) design, including:
 - (vi) HVAC systems (ducting, ventilation, equipment layouts)
 - (vii) Electrical systems (power distribution, lighting, grounding, control systems)
 - (viii) Plumbing, drainage, water supply, and fire-fighting systems
 - (ix) Coordinated service drawings and riser diagrams for full integration.
 - (x) Evaluate existing training program design, including curriculum, course modules, trainee categories, duration, evaluation methods, and competency standards.
 - (xi) Review simulator and training facilities, including layout, technical specifications, and integration for operations, signaling, rolling stock, and electrical systems training.
 - (xii) Assess existing institutional structure, governance, faculty development, staffing, and operational mechanisms for efficient Academy management.
 - (xiii) Conduct value engineering and optimization to improve cost-efficiency, operational performance, and facility sustainability.
 - (xiv) Evaluate operation & maintenance (O&M) considerations, accessibility, and long-term sustainability of buildings, systems, and training facilities.
 - (xv) Identify and communicate any shortcomings, gaps, or inconsistencies in DED; provide technical recommendations while noting that responsibility for overall detailed design remains with the DED Consultant.
 - (xvi) Review all DED documentation: design reports, drawings, calculations, bar bending schedules, MEP schematics, equipment layouts, coordinated service drawings, and builder's work drawings.
 - (xvii) Prepare Review Report, Comment Matrix, Marked-Up Drawings, Value Engineering & O&M recommendations, and Final Consolidated Report confirming readiness of the Academy design.



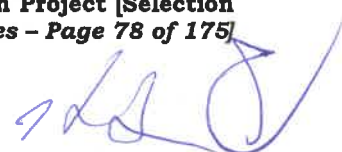
- (XVI) Bidding Documents, BOQ, Tender Drawings & Costing:** The consultant shall review BOQs, tender and construction drawings, bid documents, technical specifications, updated cost estimates, and safeguard plans. The consultant shall ensure alignment with DED outputs, ADB procurement guidelines etc. The consultant shall update the BOQs, Tender and construction Drawings, Bidding Documents, technical specifications to meet the requirements of ADB standard bidding documents and ADB Procurement Policy. The detailed requirements of this task include but are not limited to the following:
- (i) Review all bidding and procurement documents for compliance with ADB Procurement Guidelines and ADB Standard Bidding Documents (SBDs).
 - (ii) Identify gaps and misalignments with ADB requirements and prepare a gap analysis report.
 - (iii) Update BOQs only to ensure ADB-compliant structure, measurable units, clear scope, and inclusion of ADB-required safeguard and HSE items.
 - (iv) Review tender and construction drawings for completeness, packaging, numbering, and compliance with ADB tender documentation standards. The construction drawing should reflect design optimization, value engineering etc. carried out by the consultant.
 - (v) Update bid documents (ITB, BDS, GCC, PCC, BOQs, drawings, bid forms) strictly align them with ADB SBD format and mandatory clauses.
 - (vi) Ensure integration of ADB safeguard requirements (EMP, SMP, GAP, LARP, OHS, IPDP if applicable) into BOQs, specs, and bid documents.
 - (vii) Review and update the Technical Specifications Manual only to match ADB formatting, clarity, enforceability, and cross-referencing requirements.
 - (viii) Review and update cost estimates to meet ADB-required formats, breakdown structures, contingencies, taxes, insurances, and reporting formats.
 - (ix) Ensure consistency across all procurement documents as per ADB guidelines (terminology, structure, references).
 - (x) Ensure all updates maintain the integrity of the detailed engineering design and do not change technical design or system architecture.
 - (xi) Prepare and updated, ADB-compliant Procurement Readiness Package including BOQs, tender and construction drawings, bid documents, specifications, and cost estimates.
- (XVII) Supplementary Design:** The consultant shall function as the independent technical assurance entity for all Supplementary Designs, Manuals, and Detailed Engineering Design (DED) deliverables under the ML-1 project. The consultant will verify compliance with the Approved Preliminary Design (APD), Original Preliminary Design (OPD), Pakistan Railways standards, and applicable international practices. The scope includes multidisciplinary review, confirmation of design completeness and accuracy, identification of gaps and risks, and validation of engineering solutions to ensure construction readiness. The consultant shall provide clear, time-bound recommendations to optimize constructability, operational efficiency, safety, maintainability, and integration across all design packages. The detailed requirements of this task include but are not limited to:
- (i) Review APD-based Detailed Engineering Design (DED) for all disciplines (track, structures, signaling, telecom, power, buildings, yards, depots, drainage, etc.) to ensure completeness, technical soundness, and internal consistency.
 - (ii) Verify alignment with both APD and OPD design principles, ensuring the DED does not contradict OPD's long-term upgrade path (160 km/h, grade separations, maintenance depots, hot-box detection, fencing, etc.).



- (iii) Identify shortcomings, gaps, inconsistencies, or missing elements in the DED, Supplementary Designs, drawings, , and calculations, and formally notify the DED Consultant and Client.
- (iv) Review supplementary designs/drawings/reports prepared to bridge APD and OPD, including 160 km/h Hyderabad–Rohri upgrades, grade separations, depots, maintenance facilities, power supply, and drainage.
- (v) Assess special components such as Proposal level design of Kotri/Hyderabad intersection upgrades, intermodal development proposals, terminal layouts, and staging plans for operational improvements.
- (vi) Check adequacy of surveys and investigations, including geotechnical, hydrological, structural, and topographic inputs required to finalize the DED.
- (vii) Review BOQs, cost estimates, technical specifications, and tender-ready documents for accuracy, consistency, measurability, and compliance with ADB procurement structure and formatting requirements.
- (viii) Examine tender drawings, cross-checking APD and Supplementary Designs to ensure proper detailing, numbering, references, and inclusion of all required sheets.
- (ix) Validate that design is modular and upgrade-ready, enabling seamless future enhancement from APD operating speeds (120–160 km/h) to OPD standards, without contradicting any approved design principles.
- (x) Provide continuous, iterative review support by examining submitted design packages, responding promptly, issuing review comments, participating in meetings, and verifying revisions with no additional cost for extended review duration.

55. **Overall Value Engineering Requirements Applicable on all Design Review:** In addition to the specific value engineering requirements mentioned above the consultant shall also carry out the following: The Value Engineering (VE) study shall be an integral part of the review process, applied to all aspects of the design. A systematic, multi-disciplinary study to identify and recommend cost-effective alternatives in design solutions, materials, and methodologies through structured workshops, targeting optimization of life-cycle costs. The value engineering requirements include but are not limited to the following:

- **Design Documentation Analysis:** Review of system architecture diagrams, network plans, drawings, equipment specifications, and interface control documents.
- **Standards Compliance Checking:** Verify all system designs against the required standards listed in the DBR and in this document.
- **Technology Obsolescence and Future-Proofing Review:** Assess the chosen technologies for modernity, vendor support, and upgrade paths.
- **Integration and Interface Workshop:** Facilitate meetings to ensure seamless integration between systems designed by different specialists or sub-consultants.
- **Liaison with Designer:** Formal process to submit technical queries on system functionality and integration and confirm resolutions. The consultant shall have active coordination with Design consultant in line with the requirements of this document.
- **Conduct Structured Value Engineering Workshops:** Organize and facilitate a minimum of two formal VE workshops at strategic stages of the design review process (e.g., after initial design review and after draft report comments are incorporated). Ensure participation of key stakeholders, including Pakistan Railways (PR), the Project Implementation Unit (PIU), ADB, and the Design



Consultant. Employ structured VE methodology including information, speculation, evaluation, and development phases.

- **Materials Optimization and Specification Review:** Analyze alternatives for major materials (e.g., local vs. imported aggregates, cement types compatible with local conditions, alternative steel grades) that meet performance specifications but may offer cost savings or logistical advantages.
- **Specification Rationalization:** Review technical specifications to ensure they are performance-based and not overly restrictive or proprietary, thereby promoting broader competition and lower prices during bidding.
- **Design Solution Analysis and Alternatives**
 - a. **Geotechnical and Foundation Solutions:** Propose and evaluate alternative foundation types (e.g., shallow foundations vs. deep piles, ground improvement techniques like vibro-compaction) based on verified soil data to reduce cost and construction time.
 - b. **Structural Systems:** Evaluate alternative bridge and viaduct types (e.g., span arrangements, pre-stressed concrete girders vs. composite steel girders) for cost-effectiveness and constructability.
 - c. **Earthworks and Slope Protection:** Conduct a cost-benefit analysis of different slope protection methods (e.g., riprap vs. gabions vs. geosynthetic-reinforced walls) and earthwork optimization to balance cut and fill, minimizing borrow and waste.
- **Construction Methodology and Phasing Analysis**
 - a. **Modern Techniques:** Suggest construction methods that reduce time, cost, and risk (e.g., use of precast elements for culverts, platforms, and bridge components; mechanized track laying techniques).
 - b. **Traffic and Possession Planning:** Review construction phasing and possession plans to critically minimize disruption to existing railway operations, thereby reducing associated "possession costs" and economic impacts.
 - c. **Staged Implementation:** Recommend modular or staged construction approaches where beneficial, allowing for earlier partial commissioning and revenue generation.
- **Standardization and Design Efficiency**
 - a. Identify opportunities to standardize designs across the 480 km corridor (e.g., typical culvert designs, standard bridge spans, uniform station elements, modular building components).
 - b. Quantify benefits including reduced design effort, economies of scale in procurement, simplified construction, and lower long-term maintenance and spare parts inventory costs.
- **Safeguards Integration**
 - a. Optimize designs to minimize land acquisition, physical and economic displacement, and environmental footprint (e.g., refining alignment to avoid communities, reducing ROW width, using retaining walls to minimize land take).
 - b. Ensure that VE proposals do not negatively impact environmental or social safeguards and are aligned with the ESMP and LARP.

56. Overall Review and Vetting Framework:

- (i) **Review and Vetting Process:** Systematic examination of all DED deliverables (e.g., reports, calculations, drawings, BOQs, cost estimates, environmental assessments) for technical soundness, completeness, constructability, and compliance.

- (ii) Value Engineering (VE): Application of VE methodologies to optimize designs, targeting 5-10% cost savings while enhancing functionality, lifecycle performance, safety, and reliability.
- (iii) Standards and Specifications Validation: Verification of national (e.g., Pakistan Railway Bridge Rules) and international standards (e.g., Chinese Standards, UIC, AREMA, ASTM, BS), with recommendations for adjustments.
- (iv) Software and Data Verification: Independent checks on input/output data, assumptions, and calculations from DED software, including alternative analyses for discrepancies.
- (v) Quality Assurance: Implementation of an ISO 9001-compliant system, including internal audits, revision logs, and certification processes.
- (vi) Documentation and Recommendations: Production of vetted documents with mark-ups, review reports, VE proposals, and updated deliverables in English.
- (vii) Client Liaison and Knowledge Transfer: Ongoing coordination with Pakistan Railways, Design Consultant, and ADB; participation in meetings; training sessions for PR staff on VE and review techniques.

E.5 Economic and Financial Analyses

57. The Consultant shall conduct:

- (i) A financial analysis and financial sustainability assessment of the Project in accordance with ADB's Technical Guidance note for Financial Analysis and Evaluation⁵.
- (ii) An economic analysis of the Project, following ADB's Guidelines for the Economic Analysis of Projects⁶. The economic benefits identified by the consultant shall include but not be limited to environmental impacts, poverty reduction, increase of living standards, development benefits, public health benefits, and benefits from the reduction in emissions of Greenhouse Gases (GHG).

58. The Consultant shall present the outcomes of the analysis in a report.

E.6 Financial Management Assessment

59. The Consultant shall conduct financial due diligence in accordance with ADB's requirements^{7,8}. The Financial due diligence will include:

- (i) conducting a financial management assessment of the executing and implementing agencies, including (a) assessing whether previous financial management assessments have been conducted by ADB or other agencies and, if so, reviewing the results and ascertaining whether these can be used as input, (b) assessing capacity for planning and budgeting, management and financial accounting, reporting, auditing, internal controls, and information systems (c) reviewing proposed disbursement and funds-flow arrangements,

⁵ ADB. 2019. *Financial Analysis and Evaluation: Technical Guidance Note*. Manila.
<https://dx.doi.org/10.22617/TIM190489-2>

⁶ ADB. 2017. *Guidelines for the Economic Analysis of Projects*. Manila
<https://www.adb.org/documents/guidelines-economic-analysis-projects>

⁷ ADB. 2014. *Financial Management, Cost Estimates, Financial Analysis, and Financial Performance Indicators*. Operations Manual. OMG2/BP. Manila

⁸ ADB. 2015. *Financial Management Technical Guidance Note*. Manila
<https://www.adb.org/sites/default/files/page/82468/financial-management-assessment.pdf>

- and (d) concluding on the financial management risk rating and identifying and confirming measures for addressing identified deficiencies;
- (ii) supporting the preparation and agreement of cost estimates and a financing plan, which are based on verifiable data and are sufficient to support project implementation.
 - (iii) preparing financial projections and conducting financial analyses of the executing and implementing agencies, and incremental recurrent costs, to determine financial sustainability, and reviewing proposed cost-recovery and tariff policies, including affordability.
 - (iv) conducting financial evaluations (financial cost-benefit analyses) including sensitivity analyses of project components that have a cost-recovery objective.
 - (v) where significant risks are identified to project financial sustainability or viability, proposing relevant financial performance indicators to be incorporated in financial covenants; and
 - (vi) assessing and reaching agreement on financial reporting, auditing and public disclosure arrangements for the project, and, as appropriate, identifying and agreeing arrangements for receiving financial statements from executing and/or implementing agencies.
60. The Consultant's financial due diligence will include reviewing the robustness of the project's financial baseline as reflected in the finalized BOQs and cost estimates, ensuring they are sufficient to support project implementation and represent value for money.

E.7 Strategic Procurement Plan

61. Following the completion of the technical review and value engineering tasks, the Consultant shall:
- (i) Review, assess and prepare the overall procurement strategy, ensuring alignment with ADB Procurement Policy (2017), Procurement Regulations for Borrowers, and ADB Procurement Directive for ADB Borrowers Goods, Works, Nonconsulting, and Consulting Services (January 2026)
 - (ii) Review the contract packaging strategy, including number of packages, separation of civil works and systems, and suitability for attracting qualified bidders.
 - (iii) Evaluate packaging for interface management efficiency, minimizing risks between civil, systems, power, signaling, telecom, and rolling stock components.
Assess packaging based on:
 - Construction sequencing along ML-1 corridor
 - Market capacity of national and international contractors
 - Opportunities for combining or splitting packages to maximize competition
 - Risks of overly fragmented or overly large contracts
 - (iv) Verify that procurement phasing and implementation schedule are logical, achievable, and minimize disruption to ongoing railway operations.
 - (v) Check alignment between construction timelines, procurement lead times, and equipment delivery schedules.
 - (vi) Prepare or finalize the Strategic Procurement Plan (SPP) using ADB templates in consultation with the Client.
 - (vii) Review relevant procurement laws, policies, manuals, and regulations applicable in Pakistan.

- (viii) Conduct interviews with the Client and stakeholders (as required) to confirm procurement constraints, risks, and market readiness.
- (ix) Support the Client in market engagement, including information sessions, Request for Information (RFI), or consultations with potential bidders.
- (x) Hold workshops with the Client to discuss procurement strategies, packaging options, key risks, and mitigation measures.
- (xi) Introduce sustainable procurement measures and ensure their integration into specifications, BOQs, and bid documents.
- (xii) Apply risk mitigation through appropriate packaging, design optimization, and sequencing.
- (xiii) Prepare or finalize the Procurement Plan using ADB's standard template, reflecting optimized design, phasing, and packaging decisions.
- (xiv) Ensure all sustainable procurement, safeguard, HSE, and gender requirements are incorporated into technical specifications and bidding documents.
- (xv) Confirm that all procurement documentation, BOQs, specifications, tender drawings, cost estimates, are fully aligned with the approved SPP.

E.8 Procurement Support

- 62. Based on the finalized and optimized design, the Consultant shall review, finalize, Bidding Documents for all identified procurement packages including works, goods and services (operation and maintenance).
- 63. The consultant shall provide all the necessary support for organizing Early Market Engagement (EME) as per the ADB's Procurement Directives (2026), including provision of all relevant information in a timely manner and revising any documentation arising from the EME.
- 64. Provide intermittent procurement support from advertisement to contract awards for hiring of project contractor and Project Management Consultant (PMC) for all Infrastructure works, systems, goods, services, building packages and other procurements.
- 65. Finalize following, in consultation with Client:
 - (i) Bidding data sheet.
 - (ii) Evaluation and Qualification Criteria utilizing Merit Point Criteria⁹, which are appropriate for the Project, and reflecting the outcomes of market engagement and considerations made in the Strategic Procurement Plan.
 - (iii) Bidding Forms including finalized Bills of Quantities.
 - (iv) Bidding Forms including Bills of Quantities.
 - (v) Clients Requirements, including but not limited to the package scope, specifications, drawings, signage requirements, EHS requirements, coordination and interfacing requirements, personnel and equipment requirements, and supplementary information; and Conditions of contract.
- 66. The Consultant shall ensure that bidding documents contain all ADB safeguard requirements and that the conditions of contract include appropriate safeguard provisions and balanced risk allocation.
- 67. For procurement processes which start within the Consultant's contract duration (until completion of all tasks under this TOR), the Consultant shall support the Client in the pre-bid processes. Procurement support to the Client shall include:
 - (i) Ensuring that all no-objections required from ADB are applied for in a timely manner.

⁹ ADB. 2021. Use of Merit Point Criteria for Bid Evaluation. Manila <https://dx.doi.org/10.22617/TIM210516-2>

- (ii) Ensuring that the Client maintains appropriate records, documentation is properly stored, recorded and managed, and confidentiality is maintained.
 - (iii) Preparation of Invitations for Bids, organization of and attendance at pre-bid meetings and site visits, preparing replies to requests for clarifications.
 - (iv) Preparation of potential design amendments and/or amendments to the bidding documents.
 - (v) Organization and attendance at bid opening, preparation and communication of bid opening records.
 - (vi) Preparation, organization and participation for clarification meetings (if any)
 - (vii) Assist technical bid evaluation and drafting technical bid evaluation reports.
 - (viii) Recommendations on technical aspects of qualified bidders and proposals.
 - (ix) Financial bid evaluation and drafting financial bid evaluation reports.
 - (x) Preparation, organization and participation for contract finalization or negotiation meetings with the successful bidders.
 - (xi) Finalizing award of the contracts and notifying unsuccessful bidders.
 - (xii) Preparation of replies to requests for clarifications from bidders regarding the design, specifications, and BOQs.
 - (xiii) Preparation of potential design amendments and/or amendments to the bidding documents based on clarifications.
 - (xiv) Assistance in preparing for and conducting pre-bid meetings.
 - (xv) Support the EA in managing and formally responding to all technical queries received from bidders.
68. The Consultant shall pay particular attention to procedural transparency and secure confidentiality of information, and strict adherence to ADB's and national guidelines for procurement.

OUTPUT 2: INSTITUTIONAL REFORM & CAPACITY BUILDING

E.9 Institutional and Organizational Reform

A. Background and Rationale for Institutional Reforms

69. Pakistan Railways (PR) has long faced deep-rooted institutional, operational, and financial challenges that limit its ability to function as a modern, commercially oriented railway. Various studies persistent structural weaknesses, including:
- (i) Fragmented governance and unclear division of responsibilities between the Ministry of Railways (MoR), PR Headquarters, attached departments, and divisions.
 - (ii) A highly centralized culture with limited delegation and weak performance management.
 - (iii) Lack of commercial orientation, with no separation between infrastructure management and train operations, resulting in poor accountability for costs, revenues, and service quality.
 - (iv) Inefficient human resource systems, outdated skillsets, excessive non-core staff, and weak training mechanisms.
 - (v) Poor financial management, heavily subsidized operations, and an absence of cost-based tariff systems.
 - (vi) Obsolete asset management, inadequate maintenance practices, and underinvestment in modernization.
 - (vii) Limited engagement with the private sector, minimal outsourcing, for operations and maintenance.

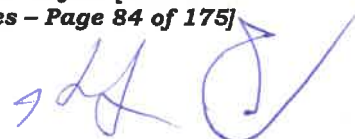
70. These challenges have led to declining freight share, deteriorating passenger services, weak safety performance, mounting losses, and an inability to leverage PR's extensive asset base. The ML-1 Karachi–Rohri Upgradation Project represents a transformational investment, but its long-term success depends on parallel and deep institutional reforms for whole of the organization.
71. Globally, railway transformations have followed similar patterns, separation of roles, commercialization, corporatization, competition, outsourcing and private-sector participation.
72. Global practices show that modern railway operations demand clear institutional separation, commercial models, and strong private-sector integration. Pakistan's ML-1 modernization must be complemented by similar reforms to achieve operational, safety, and financial sustainability.

B. Overview of Consultant Scope

73. Based on the institutional challenges identified in the background section and drawing on global and regional best practices, the Consultant shall undertake a comprehensive assessment of Pakistan Railways' current institutional structure, business model, and operational and maintenance frameworks. The Consultant shall analyze all core organizational functions, management systems, financial flows, operational processes, and governance arrangements to identify the institutional reforms necessary to ensure the long-term sustainability of Pakistan Railways. The assessment shall also identify opportunities to expand the passenger and freight market base, increase competitiveness, improve service quality, and enhance commercial viability. Special emphasis shall be placed on options for private-sector participation, outsourcing of non-core functions, commercialization of assets, and new business models aligned with modern railway practices.
74. The Consultant shall then translate these assessments into actionable reform pathways, with detailed institutional restructuring options, operational models, business plans, and implementation strategies. The detailed requirements under this task are elaborated in next section.

C. Detailed Requirements Related to Institutional Reforms

75. **Review and Diagnostic Assessment:** The Consultant shall undertake a comprehensive diagnostic assessment covering:
 - (i) Review of existing institutional structure, mandates, functions, and governance arrangements across MoR, PR Headquarters, attached departments, divisions, project units, and commercial wings.
 - (ii) Review of business processes, financial systems, budgeting, tariff-setting, cost allocation, and revenue mechanisms.
 - (iii) Review of operational and maintenance structures, including rolling stock, infrastructure, depots, workshops, stations, ICT, and safety management.
 - (iv) Review of ongoing reforms, previous studies (including World Bank Revitalization Strategy), and ML-1 operational readiness requirements.
 - (v) Review of legal, regulatory, and policy frameworks governing Pakistan Railways.
 - (vi) Benchmarking with international models.
 - (vii) Identification of strengths, weaknesses, gaps, and constraints in the existing institutional setup.



- 76. Identification of Areas for Further Evaluation and Reform Development:** Based on the diagnostic assessment, the Consultant shall identify and develop detailed reform areas, including but not limited to:
- (i) **Governance restructuring:** separation of roles (policy, regulator, infrastructure manager, operator), corporate models, autonomous business units.
 - (ii) **Private sector participation:** PPP models for operations, maintenance, rolling stock leasing, terminal/yard operations, station management, ICT, real estate, logistics.
 - (iii) **Operational efficiency improvements:** asset management reforms, Reliability, Availability, Maintainability, and Safety (RAMS) practices, predictive maintenance, depot optimization, scheduling efficiency, safety improvements.
 - (iv) **Commercial reforms:** freight modernization, passenger service enhancement, cost-recovery mechanisms, competitive pricing, new product development.
 - (v) **Human resource reforms:** organizational restructuring, skills mapping, capacity gaps, recruitment strategy, performance management systems.
 - (vi) **Financial reforms:** modern accounting, Public Service Obligation (PSO) contracts, transparent subsidy mechanisms, commercial accounting, financial sustainability model.
 - (vii) **ICT and digital transformation:** ERP, maintenance management systems, integrated operations control systems, digital ticketing, data governance.
 - (viii) **Regulatory strengthening:** development of an independent regulator model for safety, economic regulation, interoperability, and private operator licensing.
 - (ix) **Modernization of station and terminal operations** based on international models.
 - (x) **Freight sector reinvention:** logistics chain integration, multimodal terminals, private freight operators, dedicated freight services.
- 77. Preparation of a Comprehensive Business Model and Business Plan:** The Consultant shall prepare a detailed business model and business plan for Pakistan Railways post-ML1 modernized environment, including:
- (i) Evaluation of multiple business models (public operation, public operation, PPP, concession, outsourcing, mixed models). The consultant shall also review the already available business plan and Pakistan Railway Strategic Plan (PRSP) of PR.
 - (ii) Comparative assessment of public-sector vs private-sector vs hybrid models or as appropriate for:
 - Train operations (passenger and freight)
 - Infrastructure maintenance
 - Rolling stock Maintenance Repair Overhaul (MRO) (depots, workshops)
 - Station management and commercial activities
 - ICT operations and digital services
 - Yard and terminal operations
 - Safety and signal control operations
 - Expansion of PR network, new project corridors, international linkages etc.
 - (iii) Business case development for each model, including costs, revenues, risks, and implementation requirements.
 - (iv) Commercial strategy for increasing freight share, improving service quality, enhancing passenger attractiveness, and maximizing non-fare revenues.
 - (v) Financial sustainability model with projections, revenue streams, cost recovery mechanisms, and subsidy frameworks (where applicable).
 - (vi) Asset monetization and commercial utilization plan.



- (vii) The Consultant shall prepare a detailed financing plan aligned with the proposed business model and reform roadmap, covering capital and operational expenditures, revenue streams, cost-recovery mechanisms, PSO/subsidy frameworks, and private-sector investment options. The plan shall propose measures for financial sustainability for Pakistan Railways.
- (viii) Identification of operational readiness needs for ML-1 transition.

78. Identification of Priority Reforms and Preparation of Detailed Implementation Strategy: The Consultant shall identify and prioritize key reforms necessary for immediate, medium-term, and long-term transformation, including:

- (i) A prioritized roadmap of institutional reforms.
- (ii) Detailed implementation strategy for each reform including timelines, sequencing, responsible agencies, required resources, and changing management strategy.
- (iii) Policy, regulatory, and legislative changes required for implementation. The consultant shall also evaluate the needed policy reforms at national level (policy interventions required at national level) to strengthen the performance of PR.
- (iv) The Consultant shall develop a comprehensive stakeholder engagement strategy to ensure the participation, support, and alignment of all relevant actors, including MoR, PR HQ, unions, regulatory agencies, private sector operators, and other stakeholders. This will include stakeholder mapping, consultation workshops, and mechanisms to incorporate feedback into reform planning and implementation.
- (v) Development of KPIs, performance monitoring frameworks, and success indicators.
- (vi) Change-management program designed to ensure organizational acceptance.
- (vii) Identify immediate priority reforms which can be implemented with support of consultants (during the assignment period). This shall include most immediate requirement to improve operation, maintenance and financial performance of the Pakistan Railway. The consultant shall then provide full support for implementation of such reforms.

79. Assessment of Modal Shift Potential (Passenger & Freight):

- (i) Conduct a detailed assessment of current modal share and utilization of road-based passenger and freight transport in Pakistan, drawing on secondary data sources such as NHA/Motorway toll data, provincial road authorities, transport surveys, logistics market studies, and previous research.
- (ii) Analyze current and forecasted national transport demand and compare it with the existing and future capacity of Pakistan Railways, including enhancements anticipated under the ML-1 Upgradation Project (e.g., speed, capacity, reliability, terminal performance).
- (iii) Identify the key factors driving road preference for passenger and freight transport, such as cost, reliability, service availability, door-to-door logistics, travel time and assess how PR can competitively respond following ML-1 modernization.
- (iv) Develop concrete, actionable measures to shift passengers and freight from road to rail, including operational improvements, service redesign, pricing strategies, logistics enhancements, institutional reforms, regulatory measures, and targeted private-sector participation models.
- (v) Prepare a phased implementation roadmap with short-, medium-, and long-term actions, detailing required investments, responsible agencies, timelines, and

expected modal-shift impact to improve the competitiveness and financial sustainability of Pakistan Railways.

- 80. Organizational Policy Development:** The Consultant shall support the development and institutionalization of key organizational policies to guide Pakistan Railways in its modernized operational environment. This shall include, but not be limited to:
- (i) Gender mainstreaming policy: Promoting gender equity in recruitment, promotions, workplace culture, and service provision.
 - (ii) Universal accessibility policy: Ensuring stations, trains, and services are accessible to persons with disabilities and the elderly.
 - (iii) Commercialization policy: Frameworks for revenue generation, asset monetization, and non-fare income.
 - (iv) PPP and outsourcing policy: Guidelines for engaging private-sector partners in operations, infrastructure, ICT, and maintenance.
 - (v) Other cross-cutting policies as needed (sustainability, safety culture, digital governance, HR ethics).
 - (vi) The policies shall include implementation frameworks, monitoring indicators, and alignment with legal/regulatory requirements.
- 81. Implementation Support for Priority Reforms:** The Consultant shall support the Client in the early implementation of agreed high-priority reforms, including:
- (i) Assistance in establishing new governance structures or business units.
 - (ii) Support in developing legal instruments, notifications, and operational guidelines.
 - (iii) Drafting SOPs, operational frameworks, organizational restructuring documents.
 - (iv) Preparation of TORs for outsourcing/PPP processes where required.
 - (v) Support in initiating private-sector participation transactions (market sounding, risk allocation, initial procurement steps).
 - (vi) Training, workshops, and capacity-building activities for MoR and PR staff. The detailed requirements related to trainings workshops provided as part of Section E.10 below. Development of institutional strengthening plan for Pakistan Railway Academy (PRA) Walton.
 - (vii) The Consultant will (i) Assist in drafting a formal PSO policy and legal framework, (ii) Accurately identify and calculate the net cost of providing PSO services, and (iii) Prepare model legally binding PSO contracts specifying services, compensation formula, KPIs, and audit mechanisms.
- 82. Achieving Compliance with International Financial Reporting Standards (IFRS):** The Consultant will (i) Conduct a detailed gap analysis between PR's current accounting practices and IFRS requirements, (ii) Develop a phased transition plan, including changes to charts of accounts, accounting policies, and IT systems, (iii) Develop training materials and conduct extensive workshops for PR's finance staff and (iv) Provide hands-on support to prepare PR's first set of IFRS-compliant financial statements.
- (a) **Gap Analysis:** Conduct a detailed assessment of the gap between PR's current accounting policies and practices and the full requirements of IFRS.
 - (b) **Transition Plan:** Develop a phased action plan for IFRS adoption, including changes to chart of accounts, accounting policies, IT system requirements, and data collection processes.



- (c) **Capacity Building & Training:** Develop training materials and conduct extensive workshops for PR's finance, accounting, and audit staff on IFRS principles and application in line with the requirements provided in section E.10 below.
- (d) **Implementation Support:** Provide hands-on support to PR in preparing its first set of IFRS-compliant financial statements and developing a sustainable internal capacity for ongoing compliance.

83. **Digitization of Land and Asset Registry:** The Consultant will (i) Conduct a comprehensive survey, inventory, and valuation of PR's land and property assets using GIS, (ii) Develop a centralized, cloud-based Digital Land and Asset Management System (LAMS) with geo-referenced maps, lease details, and encroachment monitoring features, (iii) Develop a policy for the optimal commercial utilization of PR's land assets and (iv) Train PR's land and estate management staff on using the LAMS.

- (a) **Inventory and Valuation:** Conduct a comprehensive survey, inventory, and valuation of PR's land and property assets across the country using GIS technology.
- (b) **Digitized Land Bank:** Develop a centralized, cloud-based digital land and asset management system (LAMS). This system shall include:
 - (i) Geo-referenced maps of all PR land holdings.
 - (ii) Details of leases, tenants, rental income, and expiry dates.
 - (iii) Encroachment monitoring and alert features.
 - (iv) Modules for managing tenders and leases for commercial development.
- (c) **Policy for Commercial Development:** Develop a transparent policy and guidelines for the optimal commercial utilization of PR's land assets to maximize non-operational revenue.
- (d) **Capacity Transfer:** Train PR's land and estate management staff on using the digital system for effective asset management and revenue collection.

E.10 Capacity Building and Training

84. The Consultant shall support the Ministry of Railways (MoR) and Pakistan Railways (PR) in strengthening organizational and human capacity to implement and sustain institutional reforms, operational modernization, and business model transformation. Capacity development activities shall ensure that staff at all levels are equipped with the skills, tools, and knowledge necessary for effective governance, operational efficiency, financial sustainability, and policy implementation.
85. The Consultant shall undertake comprehensive capacity development support, including but not limited to:
- (a) **Training Needs Assessment:** Assess current staff capacity, skill gaps, and organizational knowledge requirements in line with ML-1 modernization, institutional reforms, and best international practices. Identify priority areas for training across functional domains: governance, operations, maintenance, inventory and procurement management, commercial, financial, ICT, regulatory compliance, and policy implementation.
 - (b) **Training Program Development:** Design and develop training curricula, modules, and manuals tailored to different staff categories (executive leadership, middle management, operational staff, technical specialists). Training shall cover:
 - (i) Institutional reform processes and change management
 - (ii) Governance and regulatory frameworks
 - (iii) PPP and commercialization management

- (iv) Modern operational and maintenance practices (RAMS, predictive maintenance, depot optimization)
 - (v) Financial management, cost recovery, and commercial accounting
 - (vi) ICT and digital systems, integrated operations, and ticketing
 - (vii) Freight and passenger service optimization
 - (viii) HR and performance management
 - (ix) Safety and security protocols
 - (x) Policy implementation: gender mainstreaming, universal accessibility, environmental sustainability
- (c) **Training Delivery:** The Consultant shall design and deliver a comprehensive capacity-building program for MoR and PR staff, comprising at least 10 structured training sessions and workshops (covering technical, operational, financial, ICT, and institutional topics as mentioned above), aligned with the needs of institutional reforms/ ML-1 modernization and commercialization. Training shall cover a minimum of 10-15 participants/per training (However, the number of participants will be identified by the client and numbers are only tentative) across headquarters and key divisions, ensuring knowledge transfer and operational readiness for ML-1 implementation. The consultant shall also arrange separate training program "Train the Trainer" to train specific number of individuals as master Trainers in each discipline mentioned above.
- (d) **Development of Capacity-Building Resources:** Prepare comprehensive training manuals, SOP guides, standard operating procedures, checklists, and knowledge management tools. Develop knowledge repositories and resource libraries for ongoing reference by PR staff. Provide tools for monitoring and evaluating training effectiveness, including pre- and post-training assessments.
- (e) **Institutional Strengthening:** Support the **Pakistan Railway Academy (PRA), Walton**, in establishing structured training programs, including:
- (i) Annual training plans
 - (ii) Faculty development and capacity building
 - (iii) Infrastructure, laboratories, and simulation tools for practical learning
 - (iv) Integration of modern curricula aligned with operational modernization and international best practices
- (f) **Change Management and Leadership Development:** Support MoR and PR leadership in change management, strategic decision-making, and reform adoption. Provide mentoring and coaching programs for middle management and operational supervisors to ensure effective implementation of reforms and business models.
- (g) **Monitoring, Evaluation, and Knowledge Transfer:** Establish a capacity development monitoring framework with KPIs and performance indicators. Conduct periodic assessments to measure training effectiveness and knowledge retention. Ensure sustainable knowledge transfer by mentoring internal trainers and creating training-of-trainers (ToT) programs.
86. **Development and Implementation of Project Management Systems:** The consultant will (i) Develop and implement a customized project procurement manual aligned with ADB guidelines, (ii) Develop and implement a robust financial management manual compliant with ADB requirements, (iii) Develop a safeguard monitoring framework for ESMP, LMP, and RP implementation, and (iv) Develop a contract administration toolkit for managing contracts.
- (a) **Procurement Manual & Toolkit:** Develop and implement a customized project procurement manual, aligned with ADB guidelines, including standardized

templates, checklists, and flowcharts for all processes (ICB, NCB, shopping, consultants).

- (b) **Financial Management Manual:** Develop and implement a robust financial management manual covering budgeting, accounting, disbursement, auditing, and reporting procedures compliant with ADB requirements.
- (c) **Safeguards Monitoring Framework:** Develop standardized formats and systems for internal monitoring of Environmental and Social Management Plan (ESMP), Labor Management Plan (LMP), and Resettlement Plan (RP) implementation by contractors.
- (d) **Contract Administration Toolkit:** Develop checklists and protocols for managing engineering, procurement, and construction contracts, including variations, claims, payments, and performance monitoring.

Output 3: Enhanced Financial Performance and Commercial Optimization

87. The consultant shall develop and implement a comprehensive set of interventions to improve the financial sustainability, commercial viability, and revenue diversification of Pakistan Railways (PR), with a focus on the Karachi–Rohri section. Activities will emphasize unlocking non-fare revenue, optimizing asset utilization, strengthening cost recovery, and structuring private sector participation mechanisms. The institutional integration, documentation, policies and identification of priority initiatives, preliminary design of the priority projects, preparation of bidding documents etc. all falls under the responsibility of the consultant. The program shall emphasize:

- (i) Unlocking non-fare revenue streams
- (ii) Optimizing asset utilization
- (iii) Strengthening cost recovery mechanisms
- (iv) Structuring private-sector participation (PPP, concession, outsourcing)
- (v) Institutional integration, policies, and documentation
- (vi) Preliminary design, procurement, and contractual arrangements for priority initiatives

E.11 Financial Performance and Commercial Optimization-Output

88. The detailed requirements related to the task involved are not limited to the following:

(a) Diagnostic Assessment

- (i) Review PR's financial performance, including operating revenues (passenger, freight, commercial), operating costs, and capital expenditures.
- (ii) Conduct a commercial assessment of PR assets, stations, terminals, workshops, depots, and rolling stock.
- (iii) Identify opportunities for non-fare revenue generation, including real estate, station commercial areas, advertising, and logistics services.
- (iv) Evaluate current cost structures and areas for operational efficiency, including manpower optimization and resource rationalization.
- (v) Benchmark financial and commercial performance against international best practices in railways.

(b) Business Model & Options Evaluation

- (i) Develop multiple commercial and operational models for non-fare revenue generation and commercial areas development. The model may include public sector, corporatized, hybrid, PPP, and concession models
- (ii) Assess each model for financial feasibility, revenue potential, operational impact, and risk allocation.

- (iii) Identify 2–3 priority business models and interventions for immediate focus. The consultant shall then work in detail on the selected business models and present it to PR management for approval.

(c) Revenue Diversification & Commercial Optimization

- (i) Identify and develop strategies to **maximize non-fare revenue**, including:
- Commercial development of stations, yards, and terminals
 - Real estate monetization
 - Freight logistics services and multimodal connectivity (ports, logistics hubs, feeder services)
 - Advertising and leasing opportunities
- (ii) Recommend measures to **increase passenger and freight volumes**, including:
- Improved scheduling and service quality
 - Fare optimization and dynamic pricing strategies
 - Multimodal integration with ports and logistic hubs

(d) Institutional Integration & Policy Development

- (i) Recommend institutional arrangements for financial and commercial management, including new units, reporting structures, and coordination mechanisms.
- (ii) Develop policies and documentation to support commercial operations, revenue sharing, and private sector engagement.
- (iii) Identify priority projects and initiatives for implementation, including short-, medium-, and long-term interventions.

(e) Financing & Implementation Planning

- (i) Develop a financing plan for commercial and operational initiatives, covering capital and operational costs, revenue projections, and risk-sharing arrangements.
- (ii) Recommend revenue-sharing mechanisms with private partners.
- (iii) Prepare a prioritized implementation roadmap, including timelines, responsible entities, KPIs, and monitoring mechanisms.

- (f) Identification and Development of Key Commercialization & Real Estate Initiatives:** The Consultant shall identify, prioritize, structure, and prepare complete implementation packages for high-impact commercialization and real estate-based revenue enhancement initiatives across the Karachi–Rohri section and other priority nodes of Pakistan Railways. This shall include, but not be limited to, station-based commercial development, transit-oriented development (TOD), multimodal terminal development, logistics hubs, and land-value capture opportunities. The detailed scope includes but is not limited to:

(g) Commercialization Opportunity Identification & Prioritization

- Conduct a detailed diagnostic of PR's commercial assets including stations, freight yards, vacant/underutilized land parcels, workshops, right-of-way, and buildings.
- Identify potential high-return commercial initiatives such as:
 - ✓ Retail development at stations.
 - ✓ Advertising and media rights (static/digital).
 - ✓ Warehouse and logistics centers.
 - ✓ Railway-adjacent commercial real estate (offices, mixed-use spaces).
 - ✓ Solar leasing, utility corridors, fibre-optic rights-of-way.

- Apply economic, financial, environmental, and social filters to prioritize top 2–3 initiatives for accelerated implementation.

(h) Multimodal Terminal and Logistics Hub Development (PPP/Captive):

- Identify locations suitable for multimodal terminals connecting rail with:
 - ✓ Ports (Karachi Port, Port Qasim),
 - ✓ Dry ports and economic zones,
 - ✓ Tracking and freight consolidation hubs.
- Conduct demand assessment, spatial planning, catchment analysis, and revenue potential assessment.
- Propose PPP structures (BOT, DBFOM, JV, lease, concession, management contract) and institutional arrangements for implementation.
- Develop concept designs and outline engineering layouts for shortlisted terminal/hub projects.

(i) Real Estate Development & Land Value Enhancement

- Assess PR-owned land banks for:
 - ✓ Transit-oriented development (TOD),
 - ✓ Mixed-use commercial complexes,
 - ✓ Residential/affordable housing through PPP,
 - ✓ Corporate office towers,
 - ✓ Long-term lease concessions.
- Prepare site-specific preliminary development plans, zoning recommendations, and investment rationales.
- Identify value-capture mechanisms (lease premiums, air-rights, annual rentals, profit sharing, land swaps).

(j) Feasibility Studies for Priority Commercial Initiatives

- For each shortlisted priority initiative (mini 2 projects in Consultation with Clients), the Consultant shall develop complete feasibility studies including:
 - ✓ Technical feasibility and concept engineering.
 - ✓ Market assessment and demand forecasts.
 - ✓ Financial modeling, cash-flow projections, IRR/NPV analysis.
 - ✓ Economic viability assessment.
 - ✓ Environmental and social screening (as per government and donor requirements).
 - ✓ Institutional and regulatory assessment.
 - ✓ Risk assessment and mitigation plan.

(k) Preparation of Complete Procurement & Transaction Packages

- For each approved initiative, the Consultant shall prepare all documents necessary for procurement, contracting, and implementation, including:
 - ✓ Design and technical specifications.
 - ✓ Prequalification (EOI/RFQ) documents.
 - ✓ Preparation of commercial and advertisement concessionaire (procurement documents) detailed documents for priority commercial and advertisement initiatives. Bidding documents (RFP) following local and international PPP procurement standards.
 - ✓ Draft concession agreements, lease agreements, management contracts, or JV agreements.

- ✓ Performance-based O&M requirements.
- ✓ Revenue-sharing and risk-allocation frameworks.
- ✓ Legal documentation and regulatory compliance requirements.
- ✓ Transaction structuring, investor outreach, and assistance during bid evaluation in case bidding of PPP project by concerned PR department is carried out within the period of this assignment.

(l) Implementation Roadmap & Institutional Requirements

- Develop an implementation roadmap for commercialization initiatives including roles, responsibilities, timelines, and KPIs.
- Propose institutional restructuring or creation of specialized commercial units within PR such as:
 - ✓ Commercial Development Unit (CDU),
 - ✓ PPP Transaction Cell,
 - ✓ Multimodal Integration & Terminals Unit,
 - ✓ Real Estate Development Wing.
- Provide detailed staffing, SOPs, governance arrangements, and operational workflows.

(m) O&M Strategy and Asset Management Framework

- Prepare O&M strategies for all proposed commercial and real estate facilities.
- Develop asset management protocols, lifecycle maintenance requirements, and cost-recovery mechanisms.
- Recommend monitoring frameworks, performance KPIs, and revenue assurance mechanisms.

(n) Financial Structuring & Investment Mobilization

- Develop financing strategies for commercial projects including:
 - ✓ PPP financing,
 - ✓ Commercial bank financing,
 - ✓ Private equity,
 - ✓ Viability gap funding (VGF) where applicable.
- Prepare investor pitch decks, project teasers, and support in investor engagements.

E.12 Assessment of Carbon Market Opportunities

89. The consultant shall also part of the output three conduct a separate study on assessment of carbon market opportunities for ML-1 and Pakistan Railways. The consultant shall identify, assess, and conceptually design viable carbon market interventions for the ML-1 Railway Improvement Project and related Pakistan Railways operations, with a focus on freight modal shift from road to rail and increased passenger ridership, particularly where operations will improve. This assessment shall complement the design review, operational optimization, institutional reforms, and business model development activities. The consultant shall propose practical pathways to monetize emission reductions and enhance revenue generation while supporting Pakistan's climate commitments. The assessment shall also examine how carbon market and results-based climate finance opportunities could support the long-term financial sustainability of ML-1 and Pakistan Railways, including potential use of revenues for O&M and energy transition. The detailed tasks include but not limited to the following:

i. Baseline and Emissions Assessment

- a. Review existing and projected freight and passenger traffic along the ML-1 corridor under the “without project” scenario (road-dominant, existing rail operations).
- b. Develop a conceptual greenhouse gas (GHG) baseline using internationally recognized methodologies (e.g., IPCC Guidelines, rail/transport GHG tools) for:
 - (i) Freight transport shifting from road to rail; and
 - (ii) Passenger travel shifting from road/air to rail.
- c. Assess and compare GHG emissions under alternative traction and energy supply scenarios for ML-1 operations, including, at a minimum:
 - (i) Diesel-based rail operations.
 - (ii) Grid-connected rail electrification.
 - (iii) Rail electrification combined with partial renewable energy procurement arrangements; and
 - (iv) Rail electrification supplied predominantly or fully through renewable energy sources. The consultant shall evaluate the feasibility of Solarization of railway assets and lands.

For each scenario, assess the feasibility, baseline assumptions, attribution of emission reductions, and implications for carbon market eligibility, including additionality and avoidance of double counting.

- d. Identify key data gaps and propose a practical data collection and monitoring framework suitable for Pakistan Railways and the Ministry of Railways (MoR).

ii. Identification of Carbon Market Options

- a. Review relevant carbon market mechanisms applicable to ML-1, including:
 - i. International compliance mechanisms (e.g., under Article 6 of the Paris Agreement, where applicable);
 - ii. Voluntary carbon markets; and
 - iii. Results-based climate finance / results-based payments (RBF/RBCF) instruments.
- b. Assess eligibility criteria, additionality requirements, avoidance of double counting, and alignment with Pakistan’s NDC and national MRV systems.
- c. Identify at least 2–3 feasible carbon market pathways for ML-1 (e.g., freight modal shift program, low-carbon passenger rail program, energy efficiency and electrification measures).

iii. Program / Project Design

- a. For the most promising carbon market options, prepare a design for carbon programs/projects, including:
 - (i) Geographic and operational boundaries (e.g., specific ML-1 sections, freight flows, passenger segments);
 - (ii) Indicative baselines and emission reduction potential (tCO₂/year);
 - (iii) High-level financial analysis of potential carbon revenues (range estimates) including indicative assessment of transaction costs (studies, Monitoring Reporting verification (MRV), validation,) relative to expected carbon revenues.
 - (iv) Institutional responsibilities for implementation, monitoring, reporting, and verification (MRV);
 - (v) Key risks and mitigation measures (e.g., policy, market, data availability).

- b. Propose whether a programmatic approach (e.g., railway sector program) or individual project-based approach would be more suitable for Pakistan Railways at this stage.

iv. Institutional and Governance Arrangements

- a. Review existing institutional arrangements within MoR, Pakistan Railways, and relevant government bodies (e.g., climate change authorities, EAD, etc.) that would be involved in carbon market participation.
- b. Recommend:
 - (i) Roles and responsibilities for carbon market activities (project owner, coordinating entity, MRV lead, approval processes, etc.);
 - (ii) Required institutional reforms, capacity-building, and coordination mechanisms to support sustainable participation in carbon markets;
 - (iii) Options for revenue-sharing or reinvestment of carbon revenues (e.g., re-investment into maintenance, energy efficiency, safety, or further decarbonization).

v. MRV and Data Systems

- a. Propose a practical MRV framework for ML-1 (and potentially scalable to other PR corridors), covering:
 - (i) Data sources (traffic volumes, energy consumption, load factors, etc.);
 - (ii) Monitoring and reporting responsibilities.
 - (iii) Frequency and format of reporting.
 - (iv) Requirements for third-party verification.
- b. Identify opportunities to integrate MRV requirements into:
 - (i) Detailed engineering design/IT systems (e.g., traffic and operations data); and
 - (ii) Institutional reforms recommended under the PRF.

vi. Roadmap and Implementation Plan

- a. Prepare a phased roadmap for developing and implementing carbon market interventions linked to ML-1, including:
 - (i) Short-term actions during PRF and initial project implementation (e.g., detailed studies, stakeholder engagement, data system setup);
 - (ii) Medium-term actions for program registration / issuance (e.g., documentation preparation, validation, verification);
 - (iii) Long-term considerations for scaling to other PR corridors and integrating into national rail decarbonization strategy.
- b. Identify potential implementation models for carbon market interventions, including purely public-sector approaches and hybrid or PPP-based arrangements, and outline high-level sequencing, roles, and decision points for engaging private sector partners where appropriate.
- c. Identify potential partners (e.g., government agencies, development partners, carbon market platforms, verifiers) and outline an engagement plan

90. The consultant shall as part of Output-3 deliverables provided in next section of this document provided:

- (a) Carbon Market Opportunities Assessment Report covering, baseline and project level emissions analysis, mapping of applicable carbon market mechanisms and feasibility of comparative analysis.
- (b) Concept Note(s) for Carbon Market Interventions: One or more concept notes describing priority carbon market programs/projects for ML-1 (freight and/or passenger), including indicative emission reduction and revenue potential, institutional setup, and MRV framework.

- (c) Practical roadmap and implementation plan, including institutional roles, capacity-building needs, and steps required to move from concept to registration and eventual issuance of carbon units / results-based payments.
- (d) Conduct at least one training as part of E.10 scope for MoR and Pakistan Railways staff on basics of carbon markets and relevant mechanism; proposed program design, roles of different departments in implementation.

E.13 Port–Rail Intermodal Connectivity and Integration with ML-1

91. The Consultant shall undertake a comprehensive assessment and develop proposals to ensure seamless, end-to-end rail connectivity between Pakistan's major seaports and the upgraded ML-1 corridor, with particular emphasis on direct rail access from quay-side terminals (including rail spurs located within privately leased terminal areas) through port-owned rail infrastructure (KPT and PQA land) to the public railway network and onward to ML-1.

(a) Assessment of Existing and Future Port–Rail Connectivity

The Consultant shall:

- Assess the existing rail connectivity arrangements at major seaports, including but not limited to the private terminals operating within the port zones of:
 - Karachi Port Trust (KPT), KGTL, KICT, SAPT, KGTML and all private terminals
 - Port Qasim Authority (PQA), PIBT, DP-World and other private terminals
 - Associated dry ports and inland intermodal terminals connected to these ports.
- Evaluate the entire rail-chain from quay-side (inside private terminals) to mainline (ML-1) junctions, including:
 - Rail sidings and rail spurs located inside private terminal lease areas,
 - Rail infrastructure located on KPT and PQA land (yards, loops, reception/departure tracks, signaling, switchgears etc.),
 - Interfaces between port rail systems and Pakistan Railways' public network, and
 - Connectivity and operational compatibility with the planned ML-1 upgraded corridor to accommodate uplift of quayside rail volumes from 2% scenarios of rail volume in increments up to 25%.
- Identify physical, operational, institutional, and commercial barriers that prevent seamless movement of international freight by rail between ports, terminals, and the national rail network.

(b) Freight Demand, Capacity, and Modal Share Analysis

The Consultant shall:

- Assess current and projected international freight flows (containers, bulk, liquid bulk, break-bulk and hazardous goods) handled at each port and dry port, including:
 - Port (terminal specific) throughput by commodity,
 - Current rail versus road modal shares,
 - Current freight cost per tonne per mile for road versus rail,
 - Origin - destination (O-D) patterns relevant to the Port to ML-1 corridor,
 - Cargo (freight paying) stakeholders and taxonomy of under bond freight,

- Consultant shall evaluate:
 - Yard and terminal handling capacities and limitations,
 - Rail siding lengths, axle load limits, and train length constraints,
 - Availability and adequacy of loading/unloading facilities for rail wagon cargo.
- Consultant to Identify import / export cargoes that could shift from road to rail following ML-1 upgrades, port rail improvements, and latent and divertible freight volumes operational reforms.

(c) Port–Rail Interface and Access Arrangements

The Consultant shall specifically examine:

- Track access and operational arrangements between:
 - Private terminal operators,
 - Port authorities (KPT, PQA),
 - Pakistan Railways (PR).
- Existing and required arrangements for:
 - Open or neutral access to port rail infrastructure,
 - Train path allocation (block trains) and timetable planning for freight services,
 - Shunting, marshalling, and train formation within port / terminal limits,
 - Interface management between quayside terminal rail operators and PR.
- Institutional and regulatory measures needed to ensure non-discriminatory, efficient, and predictable rail access for port-generated freight traffic.

(d) Infrastructure and Operational Improvements

Based on the assessments, the Consultant shall propose infrastructure, operational, systems, and taxonomy improvements required to achieve seamless integration between ports / quayside terminals and ML-1, including but not limited to:

- Upgrading or constructing:
 - Quay-side rail spurs and terminal rail layouts to enable direct ship-to-train operations or best-case ship-to-yard-to-train operations.,
 - Port reception and interface with departure rail yards capable of handling full-length ML-1 freight trains,
 - Missing rail links, bypasses, or grade separations within port areas and at port–rail interfaces,
 - Missing rail-crossing (automated) barrier systems and safety controls,
 - Dedicated freight loops or port connectors linking ports directly to ML-1.
- Improving terminal rail operations through:
 - Digital systems capable of planning and directing train set arrivals and loadouts and rail block train dispatch to connect ML-1 timetable for freight services
 - Mechanized and (semi) automated loading/unloading systems,
 - Reduction of shunting and re-handling within quayside / port zones,
 - Integration of rail operations and systems into the design of existing and future bulk, container, and liquid terminals.

(e) Intermodal Facilities and Railway Market Development

The Consultant shall:

- Identify and propose viable intermodal facilities and projects (e.g. inland container depots, dry ports, logistics parks, rail-served industrial zones) to:
 - Extend port hinterlands along the ML-1 corridor for block freight trains,
 - Bundle (consolidate) freight volumes suitable for rail,
 - Increase railway share in international and domestic freight transport.
- Evaluate the potential need for:
 - New or expanded berths, terminals, or port areas designed with rail-first connectivity for block trains,
 - Additional loading/unloading stations or rail-served logistics hubs linked to ML-1.

(f) Deliverables

The Consultant shall prepare:

- A master plan for proposed railway facilities in consultation with the relevant port authorities, including:
 - Port rail links, yards, sidings, and terminal connections,
 - Interfaces with ML-1 infrastructure.
- Concept-level designs for:
 - New intermodal facilities,
 - Port and terminal expansions or modifications,
 - Institutional and operational frameworks supporting port–rail integration.

92. All proposals shall be technically feasible, phased, and aligned with the capacity, axle load, and operational standards of the upgraded ML-1 corridor.

F. REPORTS AND DELIVERABLES

93. This section shall set out the requirements for reports and other deliverables required under the assignment.
94. The Consultant shall report to the Client's nominated representative on all aspects of the assignment, and the deliverables provided shall address in detail all tasks as specified in Section E "Detailed Scope of Consulting Services"
95. Unless otherwise agreed, all deliverables and documents will be in English. Two printed copies shall be provided. Plans and drawings shall be prepared so that they are easily legible in A3 format. All documents (reports and drawings) must be provided in digital, editable format (e.g., Word, Excel, AutoCAD) and converted into PDF format. Digital copies shall have all links, formulas, and fields active.
96. The format of Semi-annual Environmental Monitoring and Social Safeguards Monitoring Report shall follow ADB's minimum reporting requirements.
97. All draft Project reports issued by the Consultant shall be reviewed and approved by the Client in Consultation with ADB experts. A period of two weeks shall be allowed for the review. Final reports shall be submitted within two weeks after receiving comments on the draft.
98. Deliverables are to be supplied under a lump sum contract and will be paid in accordance with the payment milestone Table 9 below. Each deliverable must first be delivered in draft form. Each of the deliverables will be reviewed by the client team and ADB. The Consultant will then update the outputs into draft final form, considering comments from the client and ADB. A second review by the client and ADB will be made of each draft final report, and the Consultant will do a final revision before submitting the final deliverable. The new submission will then be reviewed again to determine whether the deficiencies/comments have been sufficiently addressed, in which case the deliverable will be deemed "final".

99. Reports and their content are set out in the table below:

Table 2: Deliverable Requirements and Timelines

S/No	Deliverable	Timing of Submission from Contract Signing	Detailed Content Description
1	Inception Report	Within 1 month of commencement	<ul style="list-style-type: none"> • Detailed Work Plan and Schedule (Gantt Chart) for all outputs. • Methodology for design review, VE, and other studies. • Organizational Chart and Team Deployment Schedule. • Draft Design Review Protocols and Master Issues Log (MIL) template. • Stakeholder Engagement and Communication Plan. • Proposed list of surveys for field verification
2	Monthly Progress Reports	Within 7 days of the end of each month	<ul style="list-style-type: none"> • Progress against the approved work plan. • Status of the Master Issues Log (MIL). • Summary of key technical findings, challenges, and resolved issues. • Plans and deliverables for the upcoming month.
OUTPUT 1: DESIGN REVIEW, VETTING & VALUE ENGINEERING			
3	Base Data and Engineering Surveys Verification Report	By the end of Month 3	<ul style="list-style-type: none"> • Independent assessment of the accuracy and adequacy of all survey data (Geodetic, Topographic, Geotechnical, Hydrological, Utility, Condition Surveys). • Log of data gaps, inconsistencies, and resolutions. • Report on sample field verification check. • Verification Report on Base Data and Surveys: A comprehensive report detailing the findings of the verification process for each survey type. The report shall include: <ul style="list-style-type: none"> ○ Executive Summary of findings and key recommendations. ○ Assessment of the adequacy and compliance of each survey against the TOR requirements. ○ Identification of any data gaps,

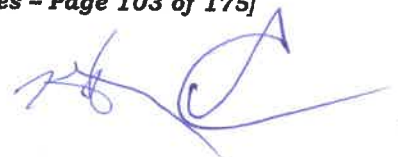
S/No	Deliverable	Timing of Submission from Contract Signing	Detailed Content Description
			<p>inconsistencies, or inaccuracies.</p> <ul style="list-style-type: none"> ○ A log of anomalies and queries raised with the Design Consultant and their resolutions. ○ A conclusive statement on the reliability and suitability of the base data for proceeding with detailed design. ○ Additional survey carried out by the consultant. ○ Any other requirement as per section E-2 of this TOR.
4	Civil and Track Works Design Report	By the end of Month 5	<ul style="list-style-type: none"> • Detailed findings on Track Alignment & Geometry, Track Structure, Earthworks, subgrade, protection works, Drainage, Bridges & culverts, Level Crossings and Garde Separation, ROBs/RUBs • Annotated drawings and calculation verification notes. • Constructability assessment from a construction perspective. • Complete set of updated design, drawings, calculations etc. as per the requirements of Section E-4 of this document. <p>The Consultant shall produce the following deliverables for this task:</p> <ul style="list-style-type: none"> • Civil and Track Works Design Review Report: A comprehensive report detailing findings for each sub-component (alignment, track, earthworks, drainage, structures). • Value Engineering Proposal Report: A separate document outlining specific, justified recommendations for cost optimization, including alternative designs, materials, or construction methods with estimated cost implications. • Design Calculation Verification Certificates: For critical structures



S/No	Deliverable	Timing of Submission from Contract Signing	Detailed Content Description
			(major bridges, complex earthworks), a certificate confirming the independent check of calculations. <ul style="list-style-type: none"> Any other document mentioned in E-4 and/or required to meet the requirement of this TOR.
5	Building Works, Stations and Yards Design Report	By the end of Month 6	<ul style="list-style-type: none"> Findings on building works, sheds, station master planning, passenger circulation, architectural and structural design, freight facilities maintenance facilities, Walton academy upgradation etc. The Consultant shall produce the deliverables in line with requirement of section E-4 of this TOR.
6	Systems Design Report	By the end of Month 8	<ul style="list-style-type: none"> Comprehensive review of Signaling & interlocking system, Telecommunication, Electrical Power Supply Electrical Traction. The Consultant shall produce the deliverables in line with requirement of section E-4 of this TOR. The deliverable shall also include any other requirement of section E-4, if not mentioned in above deliverables.
7	Safeguards Compliance and Integration Report	By the end of Month 7	<ul style="list-style-type: none"> Verification of ESIA, ESMP, LAP/LURP, and CRVA integration into DED and BOQs. Climate Resilience Design Verification Report Gender and Accessibility Audit Report. Health and Safety Design Review Note. The Consultant shall submit all required documents as per Section E-3 of this TOR and as per ADB requirements. The documents for the priority package of civil work shall be submitted in line with the requirement of the Client. The

S/No	Deliverable	Timing of Submission from Contract Signing	Detailed Content Description
			<p>timeline for the priority package is currently 4 months from commencement, However, the consultant at inception stage shall agree with client related to priority package documents.</p> <p>The deliverable shall contain the following deliverables for this task:</p> <ul style="list-style-type: none"> • Safeguards Compliance and Integration Review Report: A comprehensive report assessing the adequacy of the ESIA, ESMP, LAP, and SEP, and most importantly, how well their mitigation measures are integrated into the DED and BOQs. • Climate Resilience Design Verification Report: A statement confirming the design's alignment with the CRVA, listing any gaps or weaknesses in climate adaptation. • Gender and Accessibility Audit Report: A specific report grading the design against the GAP and universal access principles, with recommendations. • Health and Safety Design Review Note: Identifying inherent buildability and operational risks within the design and proposing mitigation through design changes.
8	Value Engineering (VE) Workshop Reports	Within 2 weeks of each workshop (Months 4 & 6)	<ul style="list-style-type: none"> • Minutes, attendance sheets, and presentations from all structured VE workshops. • Documentation of all proposed alternatives and ideas. • Value Engineering Workshop Reports: Including minutes, attendance sheets, and presentations from all facilitated workshops.
9	Value Engineering (VE) Proposal Report	By the end of Month 8	<ul style="list-style-type: none"> • Prioritized list of recommended VE Proposals (VEPs) with technical and economic evaluations. • Life-Cycle Cost Analysis (LCCA) for shortlisted alternatives.

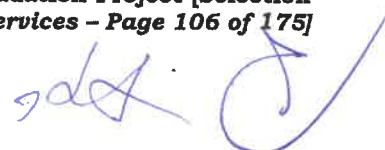
S/No	Deliverable	Timing of Submission from Contract Signing	Detailed Content Description
			<ul style="list-style-type: none"> • Quantified potential cost savings (CAPEX and OPEX). • Value Engineering Report: A comprehensive standalone report documenting: <ul style="list-style-type: none"> ○ The VE methodology applied. ○ All proposed alternatives and ideas generated. ○ Life-Cycle Cost Analysis (LCCA) for shortlisted alternatives, comparing Capital Expenditure (CAPEX) and Operational Expenditure (OPEX) of the original design versus proposed solutions. ○ Technical and economic evaluations of each proposal. ○ A prioritized list of recommended Value Engineering Proposals (VEPs) with clear justifications, potential quantified cost savings (both initial and life-cycle), and any associated impacts. ○ Implementation plan for integrating accepted VEPs into the final design. Revised Cost Estimate: An updated cost estimate reflecting the financial impact of accepted VE proposals.
10	Bidding Documents, BOQ, Tender Drawings & Costing	By the end of Month 8 (Except Priority Package for which timeline is 4 months)	<ul style="list-style-type: none"> • Report on cross-check between drawings, specs, and BOQs. • Updated set of ADB compliant BOQs, Cost Estimates and BOQs. • The consultant shall submit deliverable in line with the requirements of Section E-4 of this TOR.
11	Draft Final Comprehensive Report (Output 1)	By the end of Month 8	<ul style="list-style-type: none"> • Consolidated draft of all Output 1 • Executive summary of the entire review and VE process. Updated drawings
12	Supplementary Design Report	By the end of Month 8	<ul style="list-style-type: none"> • The consultant shall submit the detailed supplementary Design Report in line with the requirements of the Section E-4 of this TOR.



S/No	Deliverable	Timing of Submission from Contract Signing	Detailed Content Description
13	Final Updated Tender Package	By the end of Month 8 (Except for the Priority Package for which the timeline is 4 Months)	<ul style="list-style-type: none"> • Final Updated Bill of Quantities (BOQs) and Cost Estimate. • Final Updated Set of Technical Specifications. • Complete set of Bidding Documents (ITT, Conditions of Contract, Forms), fully aligned with ADB SBDs for Turnkey projects. • Final Updated Bill of Quantities (BOQ) and Cost Estimate: A clean and a marked-up version showing all changes. • Final Updated Set of Technical Specifications. • Final Tender Documents: A complete set of bidding documents in MS Word and PDF format, fully aligned with ADB SBDs and ready for publication. • Pre-Bid Conference Presentation and Minutes. • Register of Bidders' Queries and Draft Responses (for EA issuance). • Tender Evaluation Technical Report (if support is requested and activated as a separate assignment).
14	Formal Certificate of Compliance and Readiness	By the end of Month 8	<ul style="list-style-type: none"> • A signed and stamped certificate stating that the DED and tender package for the Karachi-Rohri section are technically sound, compliant, and fit for international competitive bidding. • Procurement Readiness Certificate: A final statement confirming that the tender package for the Karachi-Rohri section is complete, compliant, and fit for issue to the market.
OUTPUT 2: INSTITUTIONAL STRENGTHENING & CAPACITY BUILDING			
15	Diagnostic Assessment and Business Model Report	Within 6 months of commencement	<ul style="list-style-type: none"> • Baseline detailed assessment report. • Identification of key areas of reforms. • Detailed Business Model Report

S/No	Deliverable	Timing of Submission from Contract Signing	Detailed Content Description
			<ul style="list-style-type: none"> The consultant shall submit all reports in line with the requirement of section E-9 of this TOR.
16	Priority Reforms and Preparation of Detailed Implementation Strategy	By the end of Month 10	<ul style="list-style-type: none"> key reforms necessary for immediate, medium-term, and long-term transformation Detailed Implementation Strategy as per the requirement of section E-9 of this TOR.
17	Organizational Policy Development and Implementation Support for Priority Reforms	By the end of Month 12	<ul style="list-style-type: none"> Development of key organization policy. Report on support provided for implementation of priority reforms. The consultant shall submit this deliverable in line with the requirement of section E-9 of this TOR.
18	Final Institutional Reform & Capacity Building Report	By the end of Month 18	<ul style="list-style-type: none"> Final report on Institutional development and capacity building in line with the requirements of E-9 and E-10 of this document.
OUTPUT 3: Enhanced Financial Performance and Commercial Optimization			
19	Deliverable 1: Financial Performance Enhancement Package	By the end of Month 12	<ol style="list-style-type: none"> Diagnostic & Benchmarking Report – Complete review of PR's current financial performance, cost structure, revenues, expenditures, commercial asset utilization, and comparison with international best practices. Commercial Assets Assessment Report – Inventory and analysis of stations, terminals, yards, depots, land parcels, rolling stock, and commercial potential. Business Model Options Report – Development and assessment of multiple business models (public, corporatized, hybrid, PPP, concession, outsourcing) including risk allocation, operational impact, and feasibility. Identification of Priority Interventions– Evidence-based

S/No	Deliverable	Timing of Submission from Contract Signing	Detailed Content Description
			<p>selection of top priority financial/commercial initiatives for immediate implementation.</p> <p>5. Revenue Diversification Strategy – Detailed strategy for non-fare revenue maximization, improved passenger and freight volumes, tariff optimization, dynamic pricing, commercial area development, multimodal connectivity, advertising, leasing, and logistics services.</p> <p>6. Institutional Integration & Policy Package – Policies, SOPs, governance structures, organizational arrangements, reporting mechanisms, revenue-sharing policies, PPP engagement frameworks, and institutional strengthening measures.</p> <p>7. Financial & Risk Management Framework – Financing plan, revenue projections, capital and operational cost estimates, risk-sharing structures, and financial sustainability plan.</p> <p>8. Implementation Roadmap for Financial Performance Enhancement – Prioritized short-, medium-, and long-term action plans, KPIs, monitoring mechanisms, and timelines.</p>
20	Commercialization, Real Estate & PPP Development Package	By the end of Month 18	<p>1. Commercialization & Real Estate Opportunities Report – Identification and prioritization of commercial opportunities across stations, yards, terminals, vacant land, logistics assets, and other PR properties.</p> <p>2. Multimodal Terminals & Logistics Hub Development Framework – Location identification, demand assessment, spatial planning, concept layouts, revenue potential assessment, and</p>



S/No	Deliverable	Timing of Submission from Contract Signing	Detailed Content Description
			<p>institutional arrangements.</p> <p>3. Real Estate Development Plans – TOD concepts, mixed-use development plans, zoning recommendations, land value capture strategies, and investment rationales.</p> <p>4. Feasibility Studies for Priority Projects – Technical feasibility, concept engineering, market analysis, demand forecasts, financial models (IRR/NPV), economic analysis, environmental & social screening, regulatory and risk assessments.</p> <p>5. Complete Procurement & Transaction Packages – Preparation of EOI/RFQ, RFP, technical specs, performance-based requirements, draft concession/lease/JV contracts, revenue-sharing frameworks, compliance documentation, and bid evaluation support.</p> <p>6. O&M Strategy & Asset Management Plan – Lifecycle cost models, O&M requirements, asset management protocols, revenue assurance mechanisms, and performance KPIs for each project.</p> <p>7. Financial Structuring & Investment Mobilization Package – PPP financing structures, land-for-infrastructure models, VGF requirements, investor engagement materials, project teasers, and support for transaction marketing.</p> <p>8. Integrated Implementation Roadmap for Commercial Projects – Sequencing of interventions, institutional requirements, staffing plans, operational workflows, governance arrangements,</p>



S/No	Deliverable	Timing of Submission from Contract Signing	Detailed Content Description
			milestones, and monitoring mechanisms.
FINAL & OVERARCHING DELIVERABLES			
21	Training Execution and Evaluation Reports	Within one month after completion of each major training module	<ul style="list-style-type: none"> • Training records, pre/post-assessment results, and participant feedback for each workshop.
22	Final Overall Project Completion Report	By the end of Month 18	<ul style="list-style-type: none"> • A holistic report summarizing the entire assignment, outcomes achieved across all outputs, lessons learned, and final recommendations.
23	Special Reports	As and when required	<ul style="list-style-type: none"> • Immediate reports on critical issues. • Site Visit and Verification Reports. • Workshop Reports (e.g., Kick-off, Constructability).

100. In addition to the reports and other deliverables identified above, the Consultant will prepare and maintain full and proper records of all meetings and discussions, including minutes of kick-off meetings, technical coordination meetings, and workshops. The Master Issues Log (MIL) shall be maintained as a live document and submitted with monthly reports. The consultant shall also conduct 1 workshop under scope of this project for each deliverable and also organize 2 major workshops for wider audience. The cost of these workshops is considered included in the financial proposal of the consultant.

G. TEAM COMPOSITION AND QUALIFICATION REQUIREMENTS

G.1 Consultant team requirements

101. The Consultant shall engage personnel with the required minimum qualifications covering:
- Project Management
 - Multidisciplinary Railway Engineering (Civil, Track, Structures, Geotechnical, Hydrology, Systems)
 - Value Engineering
 - Economic and Financial Analysis
 - Environmental and Social Safeguards
 - Climate Risk and Vulnerability Assessment
 - Procurement, Contract Management, and Cost Engineering
 - Institutional Reform, Corporate Strategy, and Capacity Building
 - Commercialization and Real Estate enhancements
 - Private Sector Participation (PSP) and Public-Private Partnership (PPP) initiatives.
102. Please note that the field office contribution of international experts shall not be less than minimum percentage requirement of total input as mentioned in table 3

below. The national experts field office contribution shall not be less than 70% of total time.

103. Please note that, the services under this Contract shall be provided on a lump-sum basis. The Consultant shall be solely responsible for engaging and managing any additional personnel required to fulfill the obligations and deliverables stipulated under this Contract.

104. The required qualifications and experience of the key international and national experts, along with the key tasks they are to undertake, are shown in the tables below. The key experts will be evaluated, and scoring will be applied for the purpose of consultant selection. In addition, the Consultant shall submit CVs of Non-Key Experts, which will be evaluated on a pass/fail basis; scoring for selection will be applied only to the key experts. Minimum person-month allocations for all experts are also provided in the tables; however, the Consultant shall prepare and submit a detailed personnel work plan as part of the Full Technical Proposal (FTP), indicating the total time allocation for each staff member.

G.2 Key Expert Requirements:

Table 3: Summary of Expert Requirements (Key and Non-Key)

Category	Position	Number of Experts	Input estimated (person-month)	Minimum on field requirement of total Person Months
A. INTERNATIONAL KEY EXPERTS				
1	Team Leader / Multidisciplinary Railway Specialist	1	12	60%
2.	Railway Alignment Expert	1	6	5%
3.	Geotechnical & Foundation Expert	1	3	5%
4.	Senior Signaling & Train Control Expert	1	4	30%
5.	Institutional & Organizational Reform Specialist - Team Lead	1	12	60%
6.	Railway Economist / Business Plan Specialist	1	6	30%
7.	Land & Real Estate Commercial Development Expert	1	5	30%
Subtotal (International Key Experts)		7	48	
B. NATIONAL KEY EXPERTS				
1.	Deputy Team Leader / Senior Railway Engineer	1	18	70%
2.	Track & Alignment Engineer	1	6	70%
3.	Institutional Reform Specialist	1	8	70%
4.	PPP / Commercialization Specialist	1	6	70%
Subtotal (National Key Experts)		4	38	
C. NON-KEY EXPERTS-				

Category	Position	Number of Experts	Input estimated (person-month)	Minimum on field requirement of total Person Months
International Non-Key Experts				
1.	Railway Track Design Specialist	1	6	8%
2.	Senior Bridge & Structures Engineer	1	6	5%
3.	Telecom and ICT Expert	1	4	30%
4.	Rolling Stock & Depot Engineering Expert	1	5	10%
5.	Railway Maintenance Specialist	1	5	10%
6.	Electrical and Traction Power Expert	1	4	5%
7.	Senior Environmental Safeguards Specialist	1	4	0%
8.	Railway O&M Management Specialist	1	5	10%
9.	Financial Management & IFRS Specialist	1	6	5%
10.	Senior Procurement & Contracts Specialist	1	9	25%
11.	Freight & Commercialization Specialist	1	4	25%
Sub-Total International Non-Key Experts		11	58	
National Non-Key Experts				
1	Geotechnical Engineer	1	4	70%
2	Hydrology & Drainage Engineer	1	4	70%
3	CAD/GIS Technician & Document Controller	2	24	70%
4.	Assistant Track/Alignment Engineer	1	6	70%
5.	Drainage & Hydrology Engineer	1	4	70%
6.	S&T/Telecom Design Assistant	1	6	70%
7.	Rolling Stock/Depot Systems Analyst	1	6	70%
8.	Transport Data Analyst / Research Associate	2	16	70%
9.	Institutional Research Officer	1	6	70%
10.	HR/Training Needs Analyst	1	6	70%
11.	Financial Data Analyst	1	6	70%
12.	Freight Market/Logistics Analyst	1	6	70%
13	Land/Asset Data & GIS Officer	1	6	70%
14	Community Liaison & Stakeholder Engagement Officer	1	6	70%
15.	Civil/Structural Engineer	1	6	70%
16.	Signaling and Telecom Expert	1	6	70%
17.	Procurement and Contract	1	10	70%

PR/QCBS/CONS-01: Consultancy Services for Design Review, Institutional Strengthening, and PPP / Commercialization for the ML-1 Karachi - Rohri (480 Km) Upgradation Project [Selection 218892]
[Contract for Consultant's Services - Page 110 of 175]

Category	Position	Number of Experts	Input estimated (person-month)	Minimum on field requirement of total Person Months
	Specialist			
18.	Legal & Regulatory Framework Specialist	1	6	70%
19.	National GIS & Land Management Specialist	1	6	70%
20.	National Capacity Building & Training Specialist	1	6	70%
21.	O&M Process Improvement Engineer	1	4	70%
22.	Financial Analyst	1	4	70%
23.	Environmental & Social Specialist	1	6	70%
Subtotal National Non-Key Experts		25	160	
GRAND TOTAL ALL EXPERTS		47	304	

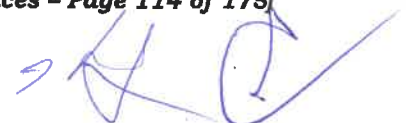
Table 4: Requirements for Key International Experts

No.	Position	Qualification and Experience Requirements	Inputs (months)
1	Team Leader / Multidisciplinary Railway Specialist	<p>Qualification: Bachelor's degree in railway engineering, civil engineering, transport engineering, systems engineering, or a related discipline. Postgraduate degrees in related discipline will be an added advantage.</p> <p>Experience: Preferably 20 years' experience with at least 8 years in senior leadership roles such as team leader, deputy team leader, or project manager. Experience in review, advisory, or quality assurance roles for detailed designs, or implementation of railway projects. Prior experience with projects financed by international financial institutions (IFIs), including ADB or equivalent, is desirable.</p> <p>Responsibilities: The major responsibilities of the Team leader Include but not limited to:</p> <ul style="list-style-type: none"> ➤ Provide overall leadership and coordination of the Review Consultant team. ➤ Ensure effective implementation of all tasks under the TOR in line with agreed scope, schedule, and quality standards. ➤ Oversee the review of TORs, consultant 	12

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>deliverables, technical designs, cost estimates, schedules, and risk assessments.</p> <ul style="list-style-type: none"> ➤ Ensure consistency between engineering solutions, safeguard requirements, institutional arrangements, and implementation strategies. ➤ Lead the preparation of consolidated review reports and coordinated responses to EA and ADB comments. ➤ Assume overall responsibility for the quality, completeness, and compliance of all deliverables. ➤ Review, endorse, and formally sign off all key deliverables prior to submission to the EA and ADB. ➤ Support the EA in identifying key implementation risks and recommending mitigation measures. 	
2	Railway Alignment Expert	<p>Qualification: Bachelor's degree in Civil Engineering, Railway Engineering, or a closely related discipline. Master's degree in Transportation Engineering, Railway Engineering, or Geotechnical / Infrastructure Engineering shall be an advantage.</p> <p>Experience: Minimum 12 years of professional experience in railway alignment planning, design review, or construction supervision of major railway or linear infrastructure projects. Experience in internationally financed projects (ADB, World Bank, JICA, AIIB, or equivalent) is desirable.</p> <p>Responsibilities: The major responsibilities of Railway Track Design Specialist shall include but not limited to:</p> <ul style="list-style-type: none"> ➤ Review alignment studies, alternatives, and final alignment proposals prepared by DED Consultants ➤ Review horizontal and vertical alignment parameters (curves, gradients, transitions, superelevation) ➤ Verify compliance with design standards, operational requirements, and safety criteria ➤ Review alignment interfaces with stations, yards, bridges, tunnels, and other structures ➤ Assess alignment impacts on land 	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		acquisition, utilities, and environmental and social aspects > Identify design gaps, risks, constructability issues, and cost implications > Provide technical advice and recommendations to the PIU > Participate in design review meetings and support ADB review missions.	
3	Geotechnical & Foundation Expert	Qualifications: Bachelor's degree in civil engineering or Geotechnical Engineering and related field. Master's degree in civil or Geotechnical / Foundation Engineering will be an added advantage. Experience: Minimum 12 years overall professional experience. At least 8 years' experience in geotechnical investigations and foundation design or design review Experience in railway or major infrastructure projects. Responsibilities: The major responsibilities shall include but not limited to: > Review of geotechnical investigation programs and reports prepared by DED Consultants > Review adequacy of site investigations, testing programs, and geotechnical parameters > Review foundation design concepts for bridges, viaducts, stations, culverts, and other railway structures > Review track formation, embankment, slope stability, and earthworks designs > Assess suitability of proposed ground improvement and foundation solutions > Identify geotechnical risks affecting construction, cost, and long-term performance > Provide technical advice and recommendations to the PIU > Participating in design review meetings and ADB missions	3
4	Senior Signaling & Train Control Expert	Qualification: Bachelor's degree in electrical engineering, electronics engineering, railway systems	4

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>engineering, telecommunications engineering, or a related discipline. Specialized training in railway signaling, train control, communications, or ICT systems for railways is an advantage.</p> <p>Experience: Preferably 10 years of professional experience in signaling and train control systems for mainline or urban railways. Experience in design review, advisory, or systems integration roles covering signaling, train control, telecommunications, and ICT systems. Knowledge of international signaling, telecommunications, ICT standards and good industry practice.</p> <p>Responsibilities: The major responsibilities shall include but not limited to:</p> <ul style="list-style-type: none"> ➤ Review signaling and train control concepts, specifications, and overall system architecture, including associated telecommunications and ICT systems. ➤ Assess system safety, reliability, interoperability, cybersecurity considerations, and operational robustness. ➤ Review communication systems supporting train control, operations, and maintenance, including data transmission, control centers, and field equipment interfaces. ➤ Review interface arrangements between signaling, telecommunications/ICT systems, rolling stock, and railway operations. ➤ Identify implementation, phasing, integration, and technology-related risks associated with signaling and communication systems and recommend mitigation measures. ➤ Provide advisory inputs to ensure compliance with applicable standards, good international practice, and project requirements. ➤ Contribute technical inputs to consolidated review reports and support responses from the EA and ADB. 	
5	Institutional & Organizational Reform Specialist - Team Lead	<p>Qualification: Bachelor's degree in engineering, economics, public administration, management, or a related discipline. Postgraduate qualifications in public</p>	12



No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>sector management, transport policy, or organizational development is an advantage.</p> <p>Experience: Preferably 12 years of experience in institutional reform, organizational development, or sector restructuring in transport or infrastructure sectors. Experience supporting public sector agencies in governance reform, organizational restructuring, and capacity development. Experience in IFI-financed projects is desirable.</p> <p>Responsibilities: The major responsibilities shall include but not limited to:</p> <ul style="list-style-type: none"> ➤ Review existing institutional, governance, and organizational arrangements of the railway sector. ➤ Assess roles, responsibilities, coordination mechanisms, and decision-making processes among relevant entities. ➤ Lead and coordinate all tasks related to Output 2 (Institutional Reforms and Capacity Building) under the TOR. ➤ Review, validate, and guide preparation of institutional reform, capacity building, and change management plans developed under the project. ➤ Identify institutional and human resource capacity gaps and recommend practical, phased capacity building and training measures. ➤ Provide oversight and advisory inputs on PPP-related institutional and policy reforms, including roles, responsibilities, and readiness of entities involved. ➤ Ensure alignment of institutional and PPP reform recommendations with technical, operational, and financial objectives of the project. ➤ Assume overall responsibility for the quality, completeness, and timely delivery of all Output 2 deliverables and support their implementation as required under the TOR. ➤ Contribute to consolidated review reports and support responses to comments from the EA and ADB. 	
6	Railway	Qualification:	6



No.	Position	Qualification and Experience Requirements	Inputs (months)
	Economist / Business Plan Specialist	<p>Bachelor's degree in economics, finance, transport economics, engineering, or a related discipline. Postgraduate qualifications in economics, finance, or business administration is an advantage.</p> <p>Experience: Preferably 10 years of experience in economic, financial, or commercial analysis of railway or transport infrastructure projects. Experience reviewing business plans, financial models, or performance improvement strategies. Familiarity with freight operations and commercial revenue generation in railways is desirable.</p> <p>Responsibilities: The major responsibilities shall include but not limited to:</p> <ul style="list-style-type: none"> ➤ Review financial performance, cost structures, revenue streams, and subsidy requirements of the railway system. ➤ Assess proposed strategies for improving financial sustainability, cost recovery, and operational efficiency. ➤ Review and evaluate freight, commercial, and business development initiatives prepared under the TOR. ➤ Carry out review and advisory support for the economic and financial evaluation of PPP projects, freight ventures, and commercialization initiatives, including assessment of affordability and value-for-money considerations. ➤ Review assumptions, methodologies, and results of financial and economic analyses, including sensitivity and risk assessments. ➤ Assess phasing, implementation risks, and fiscal implications of proposed financial and commercial strategies. ➤ Ensure consistency of financial and economic recommendations with institutional reforms and technical proposals. ➤ Provide technical inputs to consolidated review reports and support responses to comments from the EA and ADB related to Output 3. 	
7	Land & Real Estate	<p>Qualifications: Bachelor's degree in urban planning, real estate</p>	5



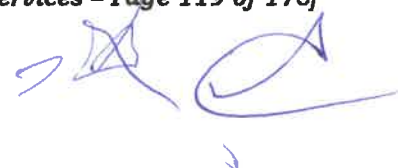
No.	Position	Qualification and Experience Requirements	Inputs (months)
	Commercial Development Expert	<p>development, economics, civil engineering, transport engineering, business administration, or a related discipline. Postgraduate qualification in urban development, real estate, finance, or management is an advantage.</p> <p>Experience: Preferably 10 years of professional experience in land, real estate, or commercial development related to transport or large infrastructure projects. Experience in reviewing or advising on transit-oriented development (TOD), station area development, railway land utilization, or asset monetization initiatives. Familiarity with commercial structuring, PPP-based real estate development, and revenue enhancement models for railway or transport agencies. Experience in projects financed by international financial institutions (IFIs) is added advantage.</p> <p>Responsibilities: The major responsibilities shall include but not limited to:</p> <ul style="list-style-type: none"> ➤ Review existing land, property, and asset holdings of the railway system with respect to commercial development potential. ➤ Assess proposed strategies for land value capture, station area development, transit-oriented development, and real estate-based revenue generation prepared under the TOR. ➤ Provide review and advisory support on commercial structuring options for land and real estate development, including PPP-based and joint development models. ➤ Evaluate financial, market, and implementation assumptions related to land and real estate commercialization initiatives. ➤ Assess institutional readiness, policy constraints, and coordination requirements for implementing land and real estate development strategies. ➤ Identify risks related to land availability, market demand, phasing, and implementation, and recommend mitigation measures. ➤ Ensure alignment of land and real estate commercialization proposals with overall 	

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>financial performance improvement objectives under Output 3.</p> <p>➤ Provide technical inputs to consolidated review reports and support responses to comments from the Executing Agency and ADB.</p>	

Table 5: Requirements for Key National Experts

No.	Position	Qualification and Experience Requirements	Inputs (months)
1	Deputy Team Leader / Senior Railway Engineer	<p>Qualifications: Bachelor's degree in civil, railway, or transport engineering or a related discipline. Postgraduate qualifications are an advantage.</p> <p>Experience: Preferably 12 years of experience in railway or major transport infrastructure projects. Experience in coordination, review, or supervision roles. Familiarity with local railway standards, practices, and institutional context.</p> <p>Responsibilities: The major responsibilities shall include but not limited to:</p> <ul style="list-style-type: none"> ➤ Support the Team Leader in day-to-day management, coordination, and implementation of tasks under the TOR. ➤ Coordinate technical review activities among international and national experts and ensure timely inputs to deliverables. ➤ Facilitate liaison with the Executing Agency and relevant local stakeholders on technical and implementation matters. ➤ Support review of technical deliverables, drawings, schedules, and site-specific issues, including coordination of field inputs where required. ➤ Monitor progress of assignments and assist the Team Leader in ensuring timely submission of reports and responses to comments. ➤ Act as Team Leader in the absence of the Team Leader, including representing the Review Consultant in meetings with the EA and supporting coordination with ADB as required. ➤ Support consolidation of review findings and 	18

No.	Position	Qualification and Experience Requirements	Inputs (months)
		contribute to preparation and finalization of consolidated review reports and technical notes.	
2	Track & Alignment Engineer	<p>Qualification: Bachelor's degree in civil engineering, railway engineering, transport engineering, or a related discipline. Postgraduate qualification or specialized training in railway track or alignment design is an advantage.</p> <p>Experience: Preferably 8 years of professional experience in railway or major transport infrastructure projects, with involvement in track and/or alignment design, review, or construction supervision. Experience in reviewing or preparing track layouts, horizontal and vertical alignments, and permanent way drawings. Familiarity with national railway standards and practices, and general awareness of international good practice.</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> ➤ Assist the International Railway Track Design Specialist in reviewing track and alignment design concepts, layouts, and drawings. ➤ Support review of horizontal and vertical alignments, including curvature, gradients, transitions, and clearances. ➤ Assist in assessing interfaces between track alignment, structures, stations, and other railway components. ➤ Support review of track-related quantities, cost estimates, and construction schedules. ➤ Identify site-specific issues, geometric constraints, and constructability concerns related to track and alignment. ➤ Support preparation of technical inputs, review comments, and responses to observations from the Executing Agency and ADB. ➤ Participate in meetings and technical discussions as required and provide support for field reviews, where necessary. 	6
3	Institutional Reform-specialist	<p>Qualifications Bachelor's degree in management, public administration, economics, engineering, or</p>	8



No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>related discipline.</p> <p>Experience Preferably 8 years of experience in institutional development, organizational reform, or capacity building in the public sector. Familiarity with railway or transport sector institutions is an advantage.</p> <p>Responsibilities</p> <ul style="list-style-type: none"> ➤ Support implementation of institutional review and reform activities. ➤ Assist in data collection, stakeholder consultations, and analysis. ➤ Support preparation of institutional reform and capacity building recommendations. ➤ Coordinate with relevant national stakeholders to ensure practicality of proposed reforms. ➤ Assist international Experts in all tasks related to output-2. 	
4	PPP / Commercialization Specialist	<p>Qualifications Bachelor's degree in economics, finance, business administration, engineering, urban planning, or a related discipline. Postgraduate qualification in finance, public policy, infrastructure management, or business administration is an advantage.</p> <p>Experience Preferably 8 years of professional experience in public-private partnerships (PPP), commercialization, or financial and commercial advisory services for infrastructure or transport projects. Experience in supporting preparation, review, or evaluation of PPP concepts, commercial frameworks, or revenue enhancement initiatives. Familiarity with national PPP policies, institutional arrangements, and approval processes.</p> <p>Responsibilities</p> <ul style="list-style-type: none"> ➤ Support review and assessment of PPP, commercialization, and private sector participation options proposed under the project. ➤ Work closely with the International Railway Economist / Business Plan Specialist and 	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>Institutional & Organizational Reform Specialist to support Outputs 2 and 3.</p> <ul style="list-style-type: none"> ➤ Assist in reviewing commercial, financial, and institutional aspects of PPP proposals, including roles, responsibilities, and risk allocation at a conceptual level. ➤ Support assessment of freight, commercial, and non-fare revenue initiatives, including market readiness and implementation constraints. ➤ Provide inputs on institutional capacity, policy frameworks, and regulatory considerations relevant to PPP and commercialization initiatives. ➤ Assist in stakeholder consultations and coordination with relevant government entities involved in PPP and commercial development. ➤ Support preparation of review findings, technical notes, and recommendations related to institutional readiness, financial performance, and commercialization. ➤ Contribute to consolidated review reports and support responses to comments from the Executing Agency and ADB related to Outputs 2 and 3. 	

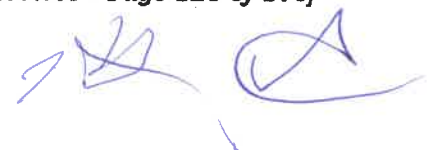
G.3 Non-Key Expert Requirements

Table 6: Requirements for International Non-Key Experts (To be evaluated as part of Consultant's Proposal on pass/fail basis)

No.	Position	Qualification and Experience Requirements	Inputs (months)
1.	Railway Track Design Specialist	<p>Qualifications: Bachelor's degree in railway engineering, civil engineering, transport engineering, or related discipline. Postgraduate qualifications or specialized training in railway track engineering or rail infrastructure is an advantage.</p> <p>Experience: Minimum 10 years of professional experience in railway track and alignment design, review, or supervision for mainline or high-capacity railway projects.</p> <p>Responsibilities: Responsibilities shall include</p>	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>but not limited to the following:</p> <p>The Railway Track Design Specialist shall be responsible to assist in reviewing, validating, and optimizing the track alignment and permanent way design for the ML-1 Karachi-Rohri (480 km) Upgradation Project. The Expert shall assess horizontal and vertical alignment, track geometry, formation design, ballast profile, rail sections, sleepers, fastening systems, turnouts, level crossings, and track structures to ensure compliance with international railway standards and project specifications for high-capacity and higher-speed operations. The Specialist shall evaluate design interfaces with bridges, stations, signaling, electrification (where applicable), and drainage systems to ensure technical compatibility and operational safety. He/she shall review load calculations, axle load requirements, track modulus, and maintenance considerations to enhance durability, ride quality, and lifecycle cost efficiency. The Expert will provide technical recommendations for design improvements, risk mitigation, constructability, and phased implementation, while supporting institutional strengthening through capacity building of Pakistan Railways' engineering staff. Additionally, the Specialist shall contribute to technical due diligence inputs for PPP/commercial structuring by ensuring that track design standards align with long-term performance, safety, and operational sustainability objectives of the ML-1 project.</p>	
2.	Senior Bridge & Structures Engineer	<p>Qualifications: Bachelor's degree in civil or structural engineering or a related discipline. Postgraduate qualification in structural engineering or infrastructure engineering is an advantage.</p> <p>Experience: Minimum 10 years of experience in design, review, or supervision of bridges and major civil structures for railway or transport infrastructure projects. Experience in reviewing structural designs, drawings, and construction methodologies. Familiarity with international design standards and good industry practice.</p>	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Senior Bridge & Structures Engineer shall be responsible to assist in comprehensive review, validation, and optimization of structural designs for bridges, culverts, flyovers, retaining walls, station structures, and other associated civil works under the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall assess detailed engineering designs, structural calculations, drawings, geotechnical interface conditions, and proposed construction methodologies to ensure compliance with applicable international railway and structural design standards, safety requirements, and project specifications. He/she shall evaluate load combinations, seismic considerations, hydraulic impacts, foundation systems, and material specifications to ensure structural integrity, durability, and lifecycle performance under increased axle loads and higher operational speeds. The Specialist will review constructability, staging plans, and risk mitigation measures, while ensuring proper coordination with track, signaling, drainage, and other multidisciplinary components. In addition, the Expert shall provide technical guidance for quality assurance, value engineering, and cost optimization, contribute to institutional strengthening of Pakistan Railways through knowledge transfer, and support PPP/commercialization inputs by ensuring that structural designs meet long-term performance, safety, and bankability requirements of the ML-1 project.</p>	
3.	Telecom and ICT Expert	<p>Qualifications: Bachelor's degree in telecommunications, electrical, electronics, ICT, or a related discipline.</p> <p>Experience: Minimum 8 years of professional experience in telecommunications or ICT systems for railway or transport infrastructure projects. Experience with operational communication systems, control centers, or data networks is desirable.</p>	4



No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Telecom and ICT Expert shall be responsible to assist in reviewing, assessing, and optimizing the telecommunications and information and communication technology (ICT) systems proposed under the ML-1 Karachi-Rohri (480 km) Upgradation Project to ensure operational reliability, safety, cybersecurity, and compliance with international railway standards and best practices. The Expert shall evaluate system architecture, fiber optic backbone networks, transmission systems, operational communication systems (including GSM-R/LTE-R or equivalent), control center communication interfaces, passenger information systems, surveillance (CCTV), data centers, and disaster recovery arrangements. He/she shall review technical specifications, integration protocols, redundancy and fail-safe mechanisms, and interoperability with signaling and train control systems to ensure seamless real-time communication and data exchange across the corridor. The Specialist will assess cybersecurity frameworks, network resilience, and scalability to accommodate future traffic growth and technological upgrades. In addition, the Expert shall provide inputs on constructability, cost optimization, lifecycle maintenance planning, and capacity building of Pakistan Railways' ICT personnel, while contributing to PPP/commercialization due diligence by ensuring that telecom and ICT systems meet long-term operational, performance, and bankability requirements of the ML-1 project.</p>	
4.	Rolling Stock & Depot Engineering Expert	<p>Qualifications: Bachelor's degree in mechanical, electrical, railway engineering, or a related discipline.</p> <p>Experience: Minimum 8 years of experience in rolling stocks, depot design, engineering, review, or operations for railway projects. Experience in interface with infrastructure or systems is desirable.</p> <p>Responsibilities: Responsibilities shall include</p>	5

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>but not limited to the following:</p> <p>The Rolling Stock & Depot Engineering Expert shall be responsible to assist in reviewing and optimizing the technical specifications, compatibility, and operational performance of rolling stock and depot facilities proposed under the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall assess locomotive and carriage specifications, axle load parameters, traction systems, braking systems, energy efficiency, safety features, and maintenance requirements to ensure alignment with upgraded track standards, signaling systems, and operational speed targets. He/she shall review depot master planning, workshop layouts, stabling lines, inspection facilities, maintenance equipment, and material handling systems to ensure efficient operations, safety compliance, and lifecycle cost optimization. The Specialist will evaluate system interfaces between rolling stock, track, electrification (if applicable), signaling, and telecom systems to ensure full technical compatibility and operational reliability. Additionally, the Expert shall provide recommendations on fleet planning, asset management strategies, maintenance regimes, and capacity building of Pakistan Railways' technical staff, while contributing to PPP/commercialization due diligence by ensuring that rolling stock and depot engineering solutions are technically robust, financially viable, and aligned with long-term operational sustainability objectives of the ML-1 project.</p>	
5.	Railway Maintenance Specialist	<p>Qualifications: Bachelor's degree in engineering or a related technical discipline.</p> <p>Experience: Minimum 8 years of experience in railway maintenance planning, asset management, or maintenance operations. Experience in maintenance of track, structures, systems, or rolling stock is desirable.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p>	5



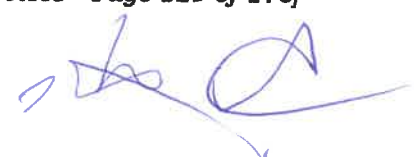
No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>The Railway Maintenance Specialist shall be responsible to assist in reviewing and strengthening the maintenance strategy, asset management framework, and lifecycle planning for infrastructure and systems under the ML-1 Karachi-Rohri (480 km) Upgradation Project. The Expert shall assess maintenance requirements for track, bridges and structures, signaling and telecom systems, stations, depots, and rolling stock interfaces to ensure reliability, safety, and long-term operational sustainability. He/she shall evaluate preventive, predictive, and corrective maintenance regimes; inspection schedules; maintenance standards; resource planning; spare parts management; and maintenance facility adequacy in line with international railway best practices. The Specialist will review asset management systems, condition monitoring approaches, performance indicators, and digital maintenance tools to optimize lifecycle costs and minimize downtime. Additionally, the Expert shall provide recommendations for institutional strengthening, including development of maintenance manuals, standard operating procedures (SOPs), training programs, and capacity building of Pakistan Railways' technical staff. The role shall also support PPP/commercialization considerations by ensuring that maintenance obligations, performance benchmarks, and risk allocations are clearly defined, measurable, and aligned with long-term service reliability and financial sustainability objectives of the ML-1 project.</p>	
6.	<p>Electrical and Traction Power Expert</p>	<p>Qualifications: Bachelor's degree in electrical engineering or a related discipline.</p> <p>Experience: Minimum 8 years of experience in railway electrification, traction power, or power supply systems. Experience in review or advisory roles is desirable.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Electrical and Traction Power Expert shall be responsible to assist in reviewing, validating,</p>	4

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>and optimizing the proposed electrification and traction power supply systems for the ML-1 Karachi–Rohri (480 km) Upgradation Project to ensure technical soundness, operational reliability, energy efficiency, and compliance with applicable international railway standards and good industry practice. The Expert shall assess the overall electrification strategy, including traction substations, overhead catenary systems (OCS), feeder lines, switching stations, SCADA systems, protection schemes, earthing and bonding arrangements, and grid interface requirements. He/she shall review load flow studies, fault level analyses, system redundancy, power quality, and integration with signaling, telecom, and rolling stock systems to ensure safe and uninterrupted railway operations under increased traffic volumes and higher operational speeds. The Specialist will evaluate constructability, staging, safety measures, maintenance accessibility, and lifecycle cost implications, while identifying technical risks and proposing mitigation measures. Additionally, the Expert shall contribute to institutional strengthening through development of technical guidelines, operational protocols, and capacity-building support for Pakistan Railways' electrical teams, and provide inputs for PPP/commercial structuring by ensuring that traction power systems are robust, bankable, and aligned with long-term performance, availability, and sustainability objectives of the ML-1 project.</p>	
7.	<p>Senior Environmental Safeguards Specialist</p>	<p>Qualifications: Bachelor's degree in environmental sciences, engineering, social sciences, or a related discipline.</p> <p>Experience: Minimum 10 years of experience in environmental safeguards for infrastructure projects. Experience with IFI safeguard frameworks, including ADB requirements, is desirable.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p>	4



No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>The Senior Environmental Safeguards Specialist shall be responsible to assist in overseeing and reviewing all environmental safeguard aspects of the ML-1 Karachi–Rohri (480 km) Upgradation Project to ensure full compliance with applicable national environmental regulations and the safeguard requirements of ADB and other relevant financing partners. The Expert shall review and validate environmental impact assessments (EIAs), environmental management plans (EMPs), biodiversity assessments, climate risk and resilience analyses, and construction environmental management plans (CEMPs), ensuring that mitigation measures are technically sound, practical, and aligned with international good practice. He/she shall assess potential impacts related to land use, air and noise pollution, water resources, waste management, ecological habitats, and community health and safety, and recommend appropriate avoidance, minimization, and compensation strategies. The Specialist will monitor implementation of environmental mitigation measures, review contractors' compliance, support environmental monitoring and reporting systems, and provide guidance on corrective actions where necessary. Additionally, the Expert shall contribute to institutional strengthening by enhancing the environmental management capacity of Pakistan Railways, developing safeguard compliance frameworks and training modules, and advising on environmental risk allocation and performance standards within PPP/commercialization arrangements to ensure long-term environmental sustainability of the ML-1 project.</p>	
8.	Railway O&M Management Specialist	<p>Qualifications: Bachelor's degree in engineering, transport management, operations management, or a related discipline.</p> <p>Experience: Minimum 8 years of experience in railway operations and maintenance management or performance improvement. Experience in similar roles is desirable.</p>	5

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Railway O&M Management Specialist shall be responsible to assist in reviewing, evaluating, and enhancing the operational and maintenance management strategies for the ML-1 Karachi-Rohri (480 km) Upgradation Project to ensure safe, efficient, and sustainable railway operations. The Expert shall assess and optimize operational processes, maintenance planning, resource allocation, performance monitoring, and service delivery frameworks for track, rolling stock, signaling, electrification, stations, and depot facilities. He/she shall develop O&M standards, KPIs, preventive and predictive maintenance regimes, and emergency response procedures to maximize asset reliability, minimize downtime, and ensure lifecycle cost efficiency. The Specialist will provide guidance on organizational structure, staffing, institutional capacity building, and knowledge transfer to Pakistan Railways' personnel to strengthen long-term operational and maintenance capabilities. Additionally, the Expert shall support PPP/commercialization initiatives by defining service performance requirements, maintenance obligations, and risk-sharing mechanisms to ensure operational sustainability, safety, and compliance with international railway standards throughout the project lifecycle.</p>	
9	Financial Management & IFRS Specialist	<p>Qualifications: Bachelor's degree in finance, accounting, economics, or related discipline.</p> <p>Experience: Minimum 8 years of experience in financial management, accounting, or financial reporting for infrastructure projects. Familiarity with IFRS or equivalent international accounting standards is desirable.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Financial Management & IFRS Specialist shall be responsible to assist in reviewing,</p>	6



No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>assessing, and strengthening the financial management, accounting, and reporting framework for the ML-1 Karachi–Rohri (480 km) Upgradation Project in accordance with national regulations and International Financial Reporting Standards (IFRS). The Expert shall evaluate project budgeting, fund flow, financial controls, accounting systems, and financial reporting procedures to ensure accuracy, transparency, and compliance with ADB and other financing partner requirements. He/she shall provide technical guidance on financial planning, cost monitoring, variance analysis, and risk mitigation measures, including debt servicing, capital expenditure tracking, and project cost allocation. The Specialist will support institutional strengthening by developing financial reporting templates, standard operating procedures, and training modules for Pakistan Railways staff, and ensure timely preparation of audited financial statements and management reports. Additionally, the Expert shall provide advisory inputs for PPP/commercial structuring by evaluating financial sustainability, investment viability, and compliance with IFRS standards to support long-term project bankability and operational accountability.</p>	
10.	Senior Procurement & Contracts Specialist	<p>Qualifications: Bachelor's degree in engineering, law, procurement, business administration, or related discipline.</p> <p>Experience: Minimum 10 years of experience in procurement, contract administration, or contract management for large infrastructure projects.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Senior Procurement & Contracts Specialist shall be responsible to assist in providing comprehensive oversight, review, and advisory support for all procurement and contract management activities under the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall review and validate procurement plans, bidding documents, evaluation reports, contract</p>	9

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>terms, and amendments to ensure full compliance with ADB Procurement Policy (2017, as amended), ADB Procurement Directives for ADB Borrowers, and good industry practice. He/she shall provide guidance on procurement strategies for civil works, goods, and consultancy services, including contract packaging, risk allocation, performance guarantees, and post-award contract administration. The Specialist will assess contractor compliance, manage variations, extensions, and claims, and provide risk mitigation recommendations to safeguard project interests. Additionally, the Expert shall support institutional strengthening by mentoring Pakistan Railways staff in procurement and contract management, ensuring proper documentation, transparency, and accountability, and contribute to PPP/commercialization activities by providing technical input on contractual frameworks, procurement risk allocation, and long-term enforceability to ensure project bankability and successful delivery.</p>	
11.	Freight & Commercialization Specialist	<p>Qualifications: Bachelor's degree in economics, transport, business administration, engineering, or related discipline.</p> <p>Experience: Minimum 8 years of experience in freight operations, commercial development, or revenue enhancement for railway or transport projects. Experience in similar roles is desirable.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Freight & Commercialization Specialist shall be responsible to assist in reviewing, advising, and supporting the development of freight operations, commercial strategies, and revenue optimization mechanisms for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall assess existing freight handling procedures, tariff structures, logistics interfaces, cargo handling facilities, and operational efficiency to recommend improvements for</p>	4



No.	Position	Qualification and Experience Requirements	Inputs (months)
		increased throughput, cost-effectiveness, and service reliability. He/she shall develop strategies for commercial revenue generation, including multi-modal integration, value-added services, private sector partnerships, and PPP frameworks, ensuring alignment with international best practices and financial sustainability objectives. The Specialist will provide technical guidance on contractual arrangements, operational performance standards, and revenue risk management, and support institutional strengthening by transferring knowledge and building capacity within Pakistan Railways' freight and commercial teams. Additionally, the Expert shall contribute to project bankability and PPP/commercialization due diligence by ensuring that freight operations and commercial strategies are efficient, financially viable, and aligned with the long-term operational and economic objectives of the ML-1 project.	

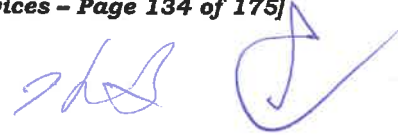
Table 7: Requirements for national Non-Key Experts (To be evaluated as part of Consultant's Proposal on pass/fail basis)

No.	Position	Qualification and Experience Requirements	Inputs (months)
1	Geotechnical Engineer	<p>Qualifications: Bachelor's degree in Civil Engineering, Geotechnical Engineering, or a related discipline.</p> <p>Experience: At least 8 years of professional experience in geotechnical investigations, analysis, and reporting for infrastructure projects such as transport, railways, roads, or large civil works.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following: The Geotechnical Engineer shall be responsible to assist in reviewing, analyzing, and providing technical guidance on all geotechnical aspects of the ML-1 Karachi-Rohri (480 km) Upgradation Project. The Expert shall assess soil investigations, subsurface conditions, foundation designs, slope stability,</p>	4

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>embankments, cuttings, retaining structures, and ground improvement measures to ensure safe and cost-effective design solutions. He/she shall evaluate geotechnical reports, laboratory test results, and field investigation data to provide recommendations for track formation, bridge foundations, culverts, and other civil infrastructure works. The Specialist will coordinate with design, track, and structural teams to ensure geotechnical inputs are integrated into engineering designs, construction methodologies, and risk mitigation strategies. Additionally, the Expert shall contribute to quality assurance, review of contractor submissions, and provide technical advice for site investigations and remedial measures, ensuring compliance with national standards, international best practice, and project safety requirements.</p>	
2	Hydrology & Drainage Engineer	<p>Qualifications: Bachelor's degree in Civil Engineering, Water Resources Engineering, or a related field.</p> <p>Experience: Minimum 8 years of experience in hydrological analysis, drainage design, and flood assessment for infrastructure or urban development projects.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Hydrology & Drainage Engineer shall be responsible to assist in reviewing, assessing, and providing technical guidance on all hydrological and drainage aspects of the ML-1 Karachi-Rohri (480 km) Upgradation Project. The Expert shall evaluate river and stream flow data, rainfall patterns, flood risks, and hydrological modeling to inform the design of culverts, bridges, embankments, and stormwater management systems. He/she shall review drainage layouts, water conveyance structures, erosion control measures, and runoff management strategies to ensure the safety, resilience, and sustainability of railway infrastructure under extreme weather conditions. The Specialist will coordinate with track, structural, and geotechnical teams to integrate drainage solutions into overall civil designs,</p>	4



No.	Position	Qualification and Experience Requirements	Inputs (months)
		optimize constructability, and minimize maintenance risks. Additionally, the Expert shall support quality assurance, review contractor submissions, and provide recommendations for mitigating hydrological and flood-related risks in compliance with national standards, international best practices, and project specifications.	
3	CAD/GIS Technician & Document Controller Positions) (02	<p>Qualification: Diploma or Bachelor's degree in Engineering, GIS, Architecture, Computer Science, or a related discipline.</p> <p>Experience: At least 5 years of experience in CAD drafting, GIS mapping, document control, and management of technical drawings and project documentation.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The CAD/GIS Technician & Document Controller shall be responsible for supporting the ML-1 Karachi–Rohri (480 km) Upgradation Project by preparing, maintaining, and managing all technical drawings, GIS datasets, and project documentation. The Expert shall produce accurate CAD drawings for track layouts, civil works, bridges, drainage, and other infrastructure components, and integrate geospatial data to support design review, alignment analysis, and planning activities. He/she shall maintain a structured document control system to ensure proper versioning, retrieval, and storage of engineering drawings, reports, and technical submissions in compliance with project standards. The Specialist will coordinate with design, engineering, and project teams to ensure that all drawings and GIS data are up-to-date, consistent, and easily accessible for review, reporting, and construction purposes. Additionally, the Expert shall assist in preparing presentation materials, mapping outputs, and documentation required for ADB/IFI reporting, institutional strengthening, and knowledge management, while ensuring adherence to quality, accuracy, and confidentiality standards</p>	24



No.	Position	Qualification and Experience Requirements	Inputs (months)
4	Assistant Track/Alignment Engineer	<p>throughout the project lifecycle.</p> <p>Qualification: Bachelor's degree in Civil Engineering, Transportation Engineering, or a related field.</p> <p>Experience: Minimum 4 years of experience supporting alignment design, track geometry, or corridor development for railway or linear infrastructure projects.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Assistant Track/Alignment Engineer shall be responsible for providing technical support in the review, analysis, and verification of track alignment, geometry, and associated civil works for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall assist in evaluating horizontal and vertical alignments, superelevation, track formation, ballast profiles, and interfaces with bridges, culverts, and drainage systems to ensure safe, efficient, and constructible railway operations. He/she shall support the preparation, checking, and updating of technical drawings, design calculations, and alignment reports, and coordinate with senior track, civil, and structural engineers to integrate design inputs across multidisciplinary teams. Additionally, the Specialist will assist in reviewing contractor submissions, monitoring compliance with design standards, and providing inputs for value engineering, constructability, and maintenance considerations, while ensuring adherence to project specifications, international best practices, and long-term operational requirements of the ML-1 project.</p>	6
5	Drainage Hydrology & Engineer	<p>Qualification: Bachelor's degree in Civil Engineering, Water Resources Engineering, or a related discipline.</p> <p>Experience: At least 5 years of experience in drainage planning, hydraulic analysis, and stormwater management for infrastructure projects.</p>	4

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Drainage & Hydrology Engineer shall be responsible for supporting the design review, analysis, and optimization of drainage and hydrological systems for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall assess stormwater management, culvert and bridge drainage, embankment runoff, flood risks, and hydraulic structures to ensure safe and resilient railway operations under varying rainfall and flow conditions. He/she shall prepare and review hydraulic calculations, drainage layouts, and hydrological models, and coordinate with track, civil, and geotechnical teams to integrate drainage solutions with overall design and construction plans. Additionally, the Specialist will assist in reviewing contractor submissions, identifying risks, recommending mitigation measures, and ensuring compliance with national standards, international best practices, and project specifications, while supporting the long-term operational sustainability and maintenance efficiency of the railway infrastructure.</p>	
6	S&T/Telecom Design Assistant	<p>Qualification: Bachelor in Electrical Engineering, Electronics, Telecommunications, or a related field.</p> <p>Experience: Minimum 8 years of experience supporting signaling, telecom, or communication system design for transport or infrastructure projects.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The S&T/Telecom Design Assistant shall be responsible for supporting the review, preparation, and verification of signaling and telecommunications (S&T/Telecom) system designs for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall assist in developing and checking detailed design drawings, specifications, and integration layouts for signaling, train control, operational communication, and ICT systems to ensure</p>	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>compliance with project requirements, safety standards, and international best practices. He/she shall coordinate with senior signaling and telecom engineers to ensure interoperability between track, electrification, and communication systems, and assist in evaluating contractor submissions, installation methodologies, and testing procedures. Additionally, the Specialist will help maintain accurate documentation, support design review processes, and contribute to technical reports, ensuring that all signaling and telecom designs are constructible, safe, and aligned with long-term operational, maintenance, and PPP/commercialization objectives of the ML-1 project.</p>	
7	Rolling Stock/Depot Systems Analyst	<p>Qualification: Bachelor's degree in Mechanical Engineering, Electrical Engineering, Transport Engineering, or a related field.</p> <p>Experience: At least 8 years of experience in rolling stock systems, depot planning, maintenance systems, or rail operations support.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Rolling Stock/Depot Systems Analyst shall be responsible for supporting the design review, operational assessment, and optimization of rolling stock and depot systems for the ML-1 Karachi-Rohri (480 km) Upgradation Project. The Expert shall analyze depot layouts, maintenance workflows, stabling arrangements, material handling systems, and workshop facilities to ensure efficient, safe, and cost-effective operations. He/she shall assist in evaluating rolling stock interfaces with track, electrification, signaling, and traction power systems, and review maintenance regimes, preventive schedules, and depot operational procedures to enhance reliability and lifecycle performance. Additionally, the Specialist will prepare technical documentation, review contractor submissions, support integration of depot systems with overall project infrastructure,</p>	6



No.	Position	Qualification and Experience Requirements	Inputs (months)
		and provide inputs for institutional strengthening, capacity building, and PPP/commercialization strategies to ensure that rolling stock and depot systems meet operational, maintenance, and financial sustainability objectives of the ML-1 project.	
8	Transport Data Analyst / Research Associate Positions) (02	<p>Qualification: Bachelor's degree in Transport Planning, Economics, Statistics, Data Science, Engineering, or a related field.</p> <p>Experience: Minimum 5 years of experience in transport data analysis, surveys, modelling support, research studies, or performance analysis.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Transport Data Analyst / Research Associate shall be responsible for supporting the collection, analysis, and interpretation of transport and operational data for the ML-1 Karachi-Rohri (480 km) Upgradation Project. The Expert shall assist in designing and conducting surveys, compiling traffic, passenger, and freight datasets, and performing statistical and modeling analyses to inform project planning, alignment review, and operational optimization. He/she shall support the preparation of reports, performance assessments, and data-driven recommendations for design, capacity enhancement, and service improvements. Additionally, the Specialist will collaborate with senior transport and planning experts to ensure data quality, consistency, and integration with GIS, simulation, and planning tools, and contribute to institutional strengthening by developing data management protocols, dashboards, and analytical frameworks that support long-term monitoring, decision-making, and PPP/commercialization strategies for the ML-1 project.</p>	16
9	Institutional Research Officer	<p>Qualification: Bachelor's degree in Public Policy, Economics, Social Sciences, Engineering, or a related discipline.</p>	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>Experience: At least 8 years of experience in institutional analysis, policy research, organizational studies, or governance-related assignments.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Institutional Research Officer shall be responsible for supporting institutional analysis, organizational assessments, and policy research for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall collect and analyze data on organizational structures, operational processes, governance frameworks, and institutional performance of Pakistan Railways to identify gaps, bottlenecks, and areas for capacity development. He/she shall assist in preparing reports, policy briefs, benchmarking studies, and recommendations to strengthen institutional arrangements, enhance operational efficiency, and support sustainable project implementation. Additionally, the Specialist will contribute to the design and implementation of training, knowledge transfer, and capacity-building initiatives, support stakeholder consultations, and provide technical inputs for PPP/commercialization strategies to ensure that institutional frameworks, governance mechanisms, and operational processes are robust, efficient, and aligned with the long-term objectives of the ML-1 project.</p>	
10	HR/Training Needs Analyst	<p>Qualification: Bachelor's degree in Human Resources, Management, Social Sciences, or a related field.</p> <p>Experience: Minimum 5 years of experience in HR assessments, training needs analysis, capacity development, or organizational development assignments.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The HR/Training Needs Analyst shall be responsible for assessing human resources, identifying capacity gaps, and supporting</p>	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>training and organizational development initiatives for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall conduct training needs assessments, analyze workforce skills, and recommend targeted capacity-building programs for Pakistan Railways personnel involved in operations, maintenance, and project management. He/she shall assist in developing training curricula, workshops, and knowledge-transfer activities, and support the monitoring and evaluation of training effectiveness. Additionally, the Specialist will provide inputs for institutional strengthening, succession planning, and performance improvement initiatives, ensuring that HR interventions align with project objectives, enhance organizational efficiency, and support sustainable implementation, operational readiness, and PPP/ commercialization strategies for the ML-1 project.</p>	
11	Financial Data Analyst	<p>Qualification: Bachelor's degree in Finance, Economics, Accounting, Business Administration, or a related field.</p> <p>Experience: At least 5 years of experience in financial data analysis, budgeting support, cost analysis, or financial reporting for projects or organizations.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Financial Data Analyst shall be responsible for supporting financial management, analysis, and reporting for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall collect, organize, and analyze financial data related to project budgeting, expenditures, cost allocations, and revenue projections to ensure accuracy, transparency, and compliance with project and financing requirements. He/she shall assist in preparing financial reports, dashboards, variance analyses, and forecasts for senior management and ADB review, and support the evaluation of financial performance across project components. Additionally, the Specialist will contribute to institutional strengthening by</p>	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		developing tools, templates, and procedures for financial data management, providing technical support for audits and reviews, and ensuring that financial analyses inform decision-making, risk mitigation, and the long-term financial sustainability and commercialization objectives of the ML-1 project.	
12	Freight Market/Logistics Analyst	<p>Qualification: Bachelor's degree in Logistics, Supply Chain Management, Transport Economics, Business Administration, or a related field. A Master's degree is preferred</p> <p>Experience: Minimum 7 years of experience in freight demand analysis, logistics studies, market assessments, or supply chain analysis.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Freight Market/Logistics Analyst shall be responsible for supporting the analysis, planning, and optimization of freight operations and logistics for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall conduct freight demand assessments, market studies, cargo flow analysis, and supply chain evaluations to identify opportunities for revenue enhancement, operational efficiency, and multimodal integration. He/she shall assist in preparing reports, data-driven recommendations, and forecasting models for freight volumes, pricing strategies, and service planning, while evaluating risks and bottlenecks in logistics operations. Additionally, the Specialist will provide inputs for PPP/commercialization strategies, freight corridor development, and institutional strengthening by supporting knowledge transfer, capacity building, and technical guidance to Pakistan Railways personnel to ensure efficient, sustainable, and commercially viable freight operations along the ML-1 corridor.</p>	6
13	Land/Asset Data & GIS Officer	<p>Qualification: Bachelor's degree in GIS, Urban Planning, Geomatics, Engineering, or a related field.</p>	6



No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>Experience: At least 4 years of experience in land records analysis, asset mapping, GIS-based data management, or spatial analysis.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Land/Asset Data & GIS Officer shall be responsible for supporting land acquisition, asset management, and geospatial data analysis for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall collect, validate, and maintain land records, property ownership data, and existing railway asset inventories, and develop GIS-based maps and databases to support project planning, design, and implementation. He/she shall assist in analyzing spatial data for alignment optimization, encroachment assessment, and infrastructure siting, and coordinate with survey, design, and institutional teams to ensure accurate integration of geospatial information into project documentation and decision-making processes. Additionally, the Specialist will contribute to reporting, monitoring, and visualization tools, supporting land and asset-related compliance, due diligence, and institutional strengthening initiatives to facilitate timely, efficient, and transparent project execution along the ML-1 corridor.</p>	
14	Community Liaison & Stakeholder Engagement Officer	<p>Qualification: Bachelor's degree in Social Sciences, Development Studies, Communications, or a related field.</p> <p>Experience: Minimum 5 years of experience in stakeholder engagement, community consultations, public outreach, or social coordination for development projects.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Community Liaison & Stakeholder Engagement Officer shall be responsible for supporting stakeholder engagement, public</p>	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>consultations, and community coordination for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall facilitate effective communication between the project team, local communities, government agencies, and other stakeholders to ensure timely information sharing, address concerns, and promote project transparency. He/she shall assist in organizing meetings, workshops, and awareness campaigns, documenting feedback, and preparing reports on social and stakeholder engagement activities. Additionally, the Specialist will support the implementation of social safeguards, grievance redress mechanisms, and community outreach strategies, while contributing to institutional strengthening by providing inputs for capacity building, knowledge transfer, and stakeholder management protocols to enhance the social acceptability, sustainability, and smooth execution of the ML-1 project.</p>	
15	Civil/Structural Engineer	<p>Qualification: Bachelor's degree in Civil Engineering or Structural Engineering. Master's degree is desirable.</p> <p>Experience: At least 8 years of experience in design, review, or supervision of civil and structural works for infrastructure projects.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Civil/Structural Engineer shall be responsible for supporting the review, design verification, and supervision of civil and structural works for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall assist in evaluating the structural integrity of bridges, culverts, stations, track foundations, retaining walls, and other civil infrastructure, ensuring compliance with project specifications, design standards, and international best practices. He/she shall prepare and review technical drawings, calculations, and construction methodologies, provide inputs for value engineering, and support quality assurance and</p>	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		site inspection activities. Additionally, the Specialist will coordinate with multidisciplinary teams, assist in contractor submission reviews, contribute to technical reports, and support institutional strengthening and capacity-building initiatives to ensure safe, durable, and constructible civil and structural infrastructure along the ML-1 corridor.	
16	Signaling and Telecom Expert	<p>Qualification: Bachelor's degree in Electrical Engineering, Electronics, Telecommunications, or Railway Signaling & Control Systems. A Master's degree is desirable.</p> <p>Experience: Minimum 7 years of experience in signaling and telecom systems design, integration, or review for rail or transport projects.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Signaling and Telecom Expert shall be responsible for supporting the design review, integration, and verification of signaling and telecommunications systems for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall assist in evaluating signaling layouts, train control systems, operational communications, and ICT infrastructure to ensure safety, reliability, and compliance with international railway standards and project specifications. He/she shall review technical drawings, specifications, and contractor submissions, provide guidance on system interoperability with track, electrification, and rolling stock interfaces, and support testing and commissioning protocols. Additionally, the Specialist will contribute to technical reporting, knowledge transfer, and capacity-building initiatives, ensuring that signaling and telecom systems are robust, maintainable, and aligned with the operational, institutional strengthening, and PPP/commercialization objectives of the ML-1 project.</p>	6
17	Procurement and Contract Specialist	<p>Qualification: Bachelor's degree in Engineering, Business Administration, Law, Economics, or a related</p>	10

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>discipline.</p> <p>Experience: At least 8 years of experience in procurement, contract administration, bid evaluation, or contract management for infrastructure or development projects.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Procurement and Contract Specialist shall be responsible for supporting procurement planning, contract administration, and bid evaluation for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall assist in preparing and reviewing procurement documents, including tender packages, terms of reference, requests for proposals, and contract agreements, ensuring compliance with ADB and Government of Pakistan procurement regulations. He/she shall provide technical guidance on contractor selection, contract negotiation, variation orders, and post-award contract management, while monitoring contractor performance and adherence to contractual obligations. Additionally, the Specialist will support institutional strengthening by developing procurement procedures, training PIU staff, and providing advisory inputs to mitigate risks, enhance transparency, and ensure timely, cost-effective, and compliant implementation of project activities along the ML-1 corridor.</p>	
18	Legal & Regulatory Framework Specialist	<p>Qualification: Bachelor's degree in Law, Public Policy, or a related discipline.</p> <p>Experience: Minimum 8 years of experience in legal analysis, regulatory review, policy frameworks, or contractual/legal advisory services.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Legal & Regulatory Framework Specialist shall be responsible for providing legal,</p>	6



No.	Position	Qualification and Experience Requirements	Inputs (months)
		regulatory, and policy advisory support for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall review applicable laws, regulations, and contractual frameworks relevant to railway operations, infrastructure development, and PPP/commercialization initiatives. He/she shall assist in preparing legal opinions, reviewing contract clauses, ensuring compliance with national and international legal requirements, and advising on risk mitigation related to contractual, regulatory, and institutional matters. Additionally, the Specialist will support the PIU and project stakeholders in institutional strengthening, policy formulation, and alignment of project processes with governance, regulatory standards, and ADB/financier requirements, ensuring that legal and regulatory frameworks are robust, clear, and facilitate smooth implementation of the ML-1 project.	
19	National GIS & Land Management Specialist	<p>Qualification: Bachelor's degree in GIS, Urban Planning, Land Management, Engineering, or a related field.</p> <p>Experience: At least 7 years of experience in GIS applications, land management systems, spatial planning, or land-use analysis.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The National GIS & Land Management Specialist shall be responsible for supporting geospatial analysis, land management, and spatial planning for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall collect, validate, and maintain GIS and land-related data, develop spatial databases, and prepare maps and visualizations to support alignment design, land acquisition, and asset management. He/she shall assist in analyzing land use patterns, property ownership, encroachments, and infrastructure siting to inform project planning and decision-making. Additionally, the Specialist will provide technical support for institutional strengthening, capacity building, and knowledge transfer to project staff,</p>	6

No.	Position	Qualification and Experience Requirements	Inputs (months)
		ensuring that GIS and land management practices are aligned with project objectives, facilitate efficient implementation, and support timely, transparent, and compliant execution of the ML-1 corridor development.	
20	National Capacity Building & Training Specialist	<p>Qualification: Bachelor's degree in Education, Management, Social Sciences, Engineering, or a related field.</p> <p>Experience: Minimum 8 years of experience in training design, capacity building programs, institutional strengthening, or knowledge transfer initiatives.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following: The National Capacity Building & Training Specialist shall be responsible for planning, designing, and implementing capacity development and training programs for the ML-1 Karachi-Rohri (480 km) Upgradation Project. The Expert shall assess institutional and staff training needs, develop training modules, workshops, and knowledge transfer activities, and facilitate skill enhancement for PIU staff, operational teams, and other stakeholders. He/she shall support organizational strengthening by promoting best practices, improving operational efficiency, and enhancing institutional capabilities in line with project objectives. Additionally, the Specialist will monitor and evaluate the effectiveness of training programs, prepare reports on capacity-building initiatives, and provide advisory support to ensure that institutional strengthening, knowledge management, and staff development are systematically integrated into the planning, implementation, and commercialization aspects of the ML-1 project.</p>	6
21	O&M Process Improvement Engineer	<p>Qualification: Bachelor's degree in Engineering, Operations Management, or a related field.</p> <p>Experience: At least 5 years of experience in operations and maintenance planning, process optimization, or performance improvement for infrastructure or</p>	4

No.	Position	Qualification and Experience Requirements	Inputs (months)
		<p>transport systems.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The O&M Process Improvement Engineer shall be responsible for supporting the optimization and enhancement of operations and maintenance (O&M) processes for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall analyze existing O&M procedures, identify inefficiencies, and recommend process improvements to enhance reliability, safety, and cost-effectiveness of railway operations. He/she shall assist in developing standard operating procedures, maintenance schedules, and performance monitoring frameworks, while ensuring alignment with international best practices and project requirements. Additionally, the Specialist will provide technical guidance to PIU staff, support institutional strengthening, facilitate knowledge transfer, and contribute to capacity-building initiatives to improve O&M practices, reduce operational risks, and ensure sustainable and efficient management of ML-1 infrastructure and rolling stock.</p>	
22	Financial Analyst	<p>Qualification: Bachelor's degree in Finance, Economics, Accounting, or a related field.</p> <p>Experience: Minimum 8 years of experience in financial analysis, project costing, financial modelling, or investment analysis.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Financial Analyst shall be responsible for supporting financial planning, analysis, and reporting for the ML-1 Karachi–Rohri (480 km) Upgradation Project. The Expert shall analyze project costs, develop financial models, and evaluate investment options to ensure economic and financial viability of project components. He/she shall assist in budgeting, expenditure tracking, cash flow analysis, and preparation of</p>	4



No.	Position	Qualification and Experience Requirements	Inputs (months)
		financial reports for PIU, senior management, and funding agencies. Additionally, the Specialist will provide technical inputs for PPP/commercialization initiatives, support risk assessment related to financial management, and contribute to capacity-building and knowledge transfer activities to enhance the financial management capabilities of project staff, ensuring effective, transparent, and sustainable implementation of the ML-1 project.	
23	Environmental & Social Specialist	<p>Qualification: Bachelor's degree in Environmental Science, Social Sciences, Engineering, or a related discipline.</p> <p>Experience: At least 8 years of experience in environmental and social assessments, safeguards implementation, monitoring, or compliance for development projects.</p> <p>Responsibilities: Responsibilities shall include but not limited to the following:</p> <p>The Environmental & Social Specialist shall be responsible for supporting the implementation, monitoring, and compliance of environmental and social safeguards for the ML-1 Karachi-Rohri (480 km) Upgradation Project. The Expert shall assist in preparing and reviewing Environmental and Social Impact Assessments (ESIAs), management plans, and mitigation measures, ensuring alignment with national regulations and ADB safeguard requirements. He/she shall monitor the execution of environmental and social mitigation measures during design and construction, support grievance redress mechanisms, and provide guidance on community engagement, resettlement, and stakeholder consultations. Additionally, the Specialist will provide technical advisory support to PIU and project stakeholders, facilitate capacity building and knowledge transfer, and ensure that all environmental and social aspects are managed effectively to minimize risks, enhance sustainability, and ensure compliance with legal, regulatory, and lender requirements throughout</p>	6



No.	Position	Qualification and Experience Requirements	Inputs (months)
		the ML-1 project lifecycle.	

Table 8: Requirements for national Support Staff

S/No	Position	Key Roles & Responsibilities	Minimum Qualification & Experience	No. of Position	Person-Months
1	Senior Railway Engineering Assistant	Assist track, alignment, and corridor design review; coordinate with discipline experts	Preferably BE Civil or Railway Engineering or related field; ≥8 years railway experience	04	20
2	Track Engineering Assistants	Support track design review, alignment verification, and site assessments	Preferably BE Civil or Railway Engineering or related field; ≥5 years	04	20
3	Bridge & Structures Assistants	Assist in review of bridges, culverts, and structures	Preferably BE Civil or Railway Engineering or related field; ≥5 years	03	12
4	Signaling & Telecom Technicians	Support signaling, telecom, and train control system review	Preferably BE Electrical/ Telecom or related field; ≥5 years	03	12
5	Electrical & Power Technicians	Assist traction power, substations, and electrification review	Preferably BE Electrical or related field; ≥5 years	02	06
6	Rolling Stock Technical Assistants	Support rolling stock and operational compatibility analysis	Preferably BE Mechanical or related field; ≥5 years	02	06
7	Geotechnical / Materials Assistants	Assist soil investigations, testing, and material evaluation	Preferably BE Civil / Geology or related field; ≥5 years	02	06
8	Quantity Surveyor	Support cost estimates, BOQs, and cost benchmarking	Preferably BE Civil / DAE Civil or related field; ≥5 years	03	12
9	Chief Surveyor	Coordinate corridor surveys and verification	Preferably BE Civil / DAE Civil or related field ≥8 years	02	06
10	Land Surveyors	Conduct topographic and alignment surveys	Preferably BE Civil / DAE Civil or related field ≥8 years	02	06
11	GIS Analysts	Spatial analysis, corridor mapping, and asset inventory	Preferably BS GIS/ Geomatics; ≥5 years	02	06

S/No	Position	Key Roles & Responsibilities	Minimum Qualification & Experience	No. of Position	Person-Months
12	GIS Technicians	Data processing and mapping	Diploma GIS/IT; ≥3 years	03	09
13	CAD/ Drafting Assistants	Prepare drawings and design documentation	DAE Civil/ Architecture; ≥5 years	04	16
14	Data Management Assistants	Manage engineering and survey datasets	Preferably BS IT/CS; ≥3 years	02	06
15	Financial Analysis Assistants	Support financial models, demand forecasts, and PPP structuring	Preferably BS/MSc Finance/ Economics or related field; ≥5 years	02	08
16	PPP Transaction Support Assistants	Assist in PPP documentation and market sounding	Preferably BS Business/ Engineering or related field; ≥5 years	02	06
17	Market Research Assistants	Conduct market and commercial assessments	Preferably BS Economics/ Business or related field; ≥3 years	02	06
18	Economic Data Analysts	Support economic and traffic analysis	Preferably BS Economics/ Statistics or related field; ≥5 years	02	04
19	Environment Monitoring Assistants	Support environmental assessments and monitoring	Preferably BS Environmental Sciences or related field; ≥5 years	03	12
20	Social Safeguards Assistants	Support social impact assessments and stakeholder engagement	Preferably BS Social Sciences or related field; ≥5 years	03	12
21	Land Acquisition & Resettlement Assistants	Support ROW, LARF, and RAP activities	Preferably BS Social Sciences/Law or related field; ≥5 years	03	12
22	Gender & Community Liaison Assistants	Support gender and community outreach	Preferably BS Social Sciences or related field; ≥3 years	02	08
23	Stakeholder Consultation Assistants	Organize consultations and documentation	Preferably BS Social Sciences or related field; ≥3 years	03	12
24	Project Coordinator (for PIU)	Overall coordination of support staff and reporting	Preferably BS Engineering/ Management or related field; ≥8	01	18

S/No	Position	Key Roles & Responsibilities	Minimum Qualification & Experience	No. of Position	Person-Months
			years		
25	Deputy Project Coordinator (for PIU)	Support coordination and liaison	Preferably BS Engineering/Management or related field; ≥6 years	01	18
26	Finance Assistants	Support financial management and reporting	Preferably BCom/ MBA Finance or related field; ≥5 years	02	12
27	Procurement Assistants	Support ADB-compliant procurement documentation	Preferably BE Civil/MBA or related field; ≥5 years	02	8
28	Document Controllers	Manage technical and administrative documents	Preferably Bachelor degree in relevant field; ≥5 years	01	18
29	Office Manager	Office administration and logistics	Preferably BA/MBA or related field; ≥8 years	01	18
30	Office Assistants	Office support	Matric; ≥3 years	02	36
31	Drivers	Transport for field and office	Valid license; ≥5 years	18	324
32	Security Guards	Office support	Primary; ≥3 years	06	108
33	Cook	Office support	Primary; ≥3 years	04	72

H. CLIENT'S INPUT AND COUNTERPART PERSONNEL

105. This section shall set out what will be provided by the Client or arranged by it for the comprehensive consultancy services.

106. **Existing Data:** The Client shall make all existing reports and data related to the Project available to the Consultant. This includes, but is not limited to:

- a) The complete Detailed Engineering Design (DED) deliverables from the Design Consultant (all reports, calculations, drawings, specifications, and BOQs) in both hard and electronic copies.
- b) The Terms of Reference for DED.
- c) The Feasibility Study, Original Preliminary Design (OPD) Reports, Adjusted Preliminary Design (APD) Reports, and the approved Design Basis Report (DBR).
- d) All underlying survey and investigation data (Geodetic, Topographic, Geotechnical, Hydrological, Utility Mapping, and Existing Condition Surveys).
- e) All safeguard documents, including the final ESIA, ESMP, LARP/RP, SEP, CRVA, and Gender Action Plan (GAP).
- f) Relevant Pakistan Railways standards, rule books, MBG loading specifications, and bridge rules.
- g) National codes, standards, and regulations applicable to the project.

- h) **For Institutional Reform (Output 2):** All relevant documents, operational data, available asset data, land records, organizational charts, and existing policy documents of Pakistan Railways. However, in case of non-availability of data,
- i) Consultant shall survey or collect the data through his own resources or to extract from the OPD, APD or from the Feasibility study of ML-1 in consultation with Client.
107. **Office Facilities:** The consultant shall arrange its own office facility in Lahore.
108. **Accommodation, Vehicles, and Equipment:** The Consultant shall be responsible for arranging and paying for its own accommodation, specialized vehicles, and equipment (e.g., computers, engineering software, survey verification tools). The Client will facilitate the process of obtaining necessary permits and licenses for vehicle operation only for PR premises. The Consultant will be responsible for organizing its own transportation for site visits along the 480 km corridor and for travel related to stakeholder engagement for all outputs.
109. **Security:** The overall security situation in the project area will be assessed during the inception phase. The Client will facilitate coordination with local law enforcement agencies. The Consultant is primarily responsible for the safety and security of their personnel and shall develop and implement a comprehensive Security Management Plan for all site visits and field activities. The cost of any dedicated security personnel required for specific high-risk site visits shall be borne by the Consultant.

I. BASIS OF PAYMENT

110. This section shall outline how the Consultant shall be paid.
111. Remuneration of the Consultant shall be on a lump-sum basis with payment made against the successful submission and acceptance of key deliverables as identified in the table below. The total lump sum price shall include all costs for the provision of the services, including remuneration, reimbursables, establishment of offices, taxes, and duties.
- a) Fifty percent (50%) payment shall be made on submission (given that deliverables comprised of all the tasks) and remaining Fifty percent (50%) payment shall be made on acceptance of deliverables.
- b) Five percent (5%) retention money shall be deducted from each interim payment which shall be returned after successful completion of the assignment.

Table 9: Payment Schedule Against Deliverables

S/No	Deliverable / Milestone	Percentage of Total Contract Price (%)
1	Inception Report	10%
OUTPUT 1: DESIGN REVIEW, VETTING & VALUE ENGINEERING		35%
2	Design Review & Technical Due-Diligence Report (Civil, Track, Buildings, Systems)	10%
3	Value Engineering Report & Optimization Recommendations including Master Plan	15%

S/No	Deliverable / Milestone	Percentage of Total Contract Price (%)
4	Updated Detailed Designs, BOQs, Tender Drawings & Bidding Documents	10%
OUTPUT 2: INSTITUTIONAL STRENGTHENING & CAPACITY BUILDING		25%
5	Institutional Assessment & Business Model Review	05%
6	Priority Institutional Reforms, Policies & Implementation Roadmap	10%
7	Capacity-Building Plan & Training Delivery Completion Report	10%
OUTPUT 3: Enhanced Financial Performance and Commercial Optimization		20%
8	Financial Performance Enhancement Strategy	10%
9	Commercialization, Real Estate & PPP Development Package	10%
FINAL & OVERARCHING DELIVERABLES		10%
10	Draft Final Consolidated Report	05%
11	Final Report (Incorporating Client Feedback)	05%
Total		100%

112. **Provisional sums** are envisaged for the following items to cover costs which cannot be precisely defined at contract signing:
- The use and payment of provisional sums shall be regulated in accordance with the conditions of the Consultant's contract, requiring prior written approval from the Client for any expenditure. Payments against provisional sums will be made upon submission of certified invoices and supporting documentation and will not form part of the lump-sum payment schedule in Table 9.
113. The Consultant's performance shall be subject to monitoring and management by the Client as regulated by the Key Performance Indicators (KPIs) contained in the conditions of contract. KPIs shall include, but not be limited to:
- On-time submission of deliverables as per the approved schedule
 - Quality and comprehensiveness of technical review reports and value engineering proposals
 - Effectiveness of issue resolution as tracked in the Master Issues Log
 - Demonstrated success in knowledge transfer and capacity building of counterpart staff
 - Achievement of targeted cost savings (5-10%) through Value Engineering without compromising quality or safeguards
 - Completeness and ADB-compliance of final tender documents
 - Successful establishment of operational systems (LAMS, PIU)
 - Client satisfaction ratings from Pakistan Railways and ADB

J. SUPPLEMENTARY INFORMATION

114. This section describes Supplementary Information (SI) to be provided by Client to successful consultant in hard and soft after due process of approval for disclosure.

- a. The Terms of Reference for Detailed Engineering Design
- b. Reports and drawings for Detailed Engineering Design
- c. Reports and drawings for Adjusted Preliminary Design reports
- d. Reports and drawings for Original Preliminary Design reports
- e. Feasibility Study of ML-1
- f. Pakistan Railway Standards
- g. Any other relevant information, other than above, shall be provided on demand by consultant with proper justification for its relevance to the assignment.

K. Implementation Arrangements

L. Data, Services and Facilities to be Provided by the Client

115. The PIU will provide all possible assistance and information as may be reasonably requested by the Consultant to carry out their obligations. This is particularly related to the delivery of designs prepared by the Design Consultants. Designs will be provided in original soft format and PDF files.

116. The Consultant will be completely responsible for all logistic support of its team, including but not limited to transportation, accommodation, office space, maintenance, water, electricity, telecommunication services, high-band Internet connection, office supplies and consumables and any other related good required to complete the task.

M. Facilities To Be Provided by The Client

117. The Client will provide to the Consultant with access to key relevant reports, studies and other documents required to carry out the design review and related documents preparation, including but not limited to the already prepared prototype architectural designs; the initial equipment list including their specifications and the Government's GPS maps if available for the project. The Client will also provide any available data / reports related to environment and social safeguard and related studies.

N. Facilities To Be Arranged By The Consultant

118. The Consultant will organize its own office space preferably in **Lahore** where the Team Leader will be based.

119. Depending on the implementation schedule (as indicated above), details of staffing levels will be agreed through the course of the assignment with the PIU.



Recommended Additional Content for Civil Works or Construction Supervision Assignments

Required Approval

If the Services consist of or include the supervision of civil works, the following action that require prior approval by the Client shall be added:

"Taking any action under a civil works contract designating the Consultant as "Engineer", for which action, pursuant to such civil works contract, the written approval of the Client as "Employer" is required."

Environmental, Health and Safety (EHS) Obligations

Ensure that the Contractor delivers its EHS obligations under its contract. This includes, but is not limited to the following:

1. Review the Contractor's Environment, Health and Safety Management Plan, including all updates and revisions at frequencies specified in the Contractor's contract (normally not less than once every 6 months);
2. Review all other applicable contractor's documents related to Environment, Health and Safety aspects including the health and safety manual, security management plan, etc.
3. Review and consider Environment, Health and Safety risks and impacts of any design change proposals and advise if there are implications for compliance with project requirements.
4. Undertake audits, supervisions and/or inspections of any sites where the Contractor is undertaking activities related to the Works, to verify the Contractor's compliance with Environment, Health and Safety requirements with and without contractor and/or Employer relevant representatives, as necessary, but not less than once per month
5. Undertake audits and inspections of Contractor's accident logs, community liaison records, monitoring findings and other Environment, Health and Safety related documentation, as necessary, to confirm the Contractor's compliance with Environment, Health and Safety requirements.
6. Agree remedial action/s and their timeframe for implementation in the event of a noncompliance with the Contractor's Environment, Health and Safety obligations.
7. Ensure appropriate representation at relevant meetings including site meetings, and progress meetings to discuss and agree appropriate actions to ensure compliance with Environment, Health and Safety obligations.
8. Check that the Contractor's actual reporting (content and timeliness) is in accordance with the Contractor's contractual obligations.
9. Review and critique, in a timely manner, the Contractor's Environment, Health and Safety documentation (including regular reports and incident reports) regarding the accuracy and efficacy of the documentation.
10. Undertake liaison, from time to time and as necessary, with project stakeholders to identify and discuss any actual or potential Environment, Health and Safety issues.
11. Establish and maintain a grievance redress mechanism including types of grievances to be recorded and how to protect confidentiality
12. [add any other tasks as appropriate ensuring consistency with the Consultant's contract conditions and the Contractor's contract].

Recommended Additional Content for Civil Works or Construction Supervision Assignments

Experts with EHS Experience

Key Expert/s with sufficient qualifications and experience to provide Environment, Health and Safety oversight shall be required.

The Key Expert/s academic and professional qualifications and experience to recognize and to deliver good international industry practice with respect to Environment, Health and Safety should be specified. The same expert positions should be included for evaluation in the SES and PES.

EHS Reporting Requirements

If the Services consist of or include the supervision of civil works, include the following on Environment, Health and Safety reporting:

1. Immediately notify the Client of any failure by the Contractor to comply with its Environment, Health and Safety obligations.
2. Immediately notify the Client of any allegation, incident or accident, which has or is likely to have a significant adverse effect on the environment, the affected communities, the public, Client's Personnel, Contractor's Personnel or Experts. Confidentiality of full details should be maintained for sensitive cases. The Consultant shall provide full details of such incidents or accidents to the Client within the timeframe agreed with the Client;
3. Immediately inform and share with the Client any immediate notification related to Environment, Health and Safety incidents provided to the Consultant by the Contractor, and as required of the Contractor as part of the Progress Reporting.
4. Share with the Client in a timely manner the Contractor's Environment, Health and Safety metrics, as required of the Contractor as part of the Progress Reports.

EHS Code of Conduct Requirement

The Code of Conduct should be signed by each Expert to indicate that they have:

1. received a copy of the code;
2. had the code explained to them;
3. acknowledged that adherence to this Code of Conduct is a condition of employment; and
4. understood that violations of the Code can result in serious consequences, up to and including dismissal, or referral to legal authorities.

Standard Code of Conduct Form on next page. This form can be filled out, signed and submitted prior to contract negotiations.

ENVIRONMENTAL, HEALTH AND SAFETY CODE OF CONDUCT FOR CONSULTANT'S PERSONNEL

We are the Consultant, [enter name of Consultant]. We have signed a contract with [enter name of Client] for [enter description of the Works]. These Works will be carried out at [enter the Site and other locations where the Works will be carried out]. Our contract requires us to implement measures to address environmental, health and safety risks related to the Works. This EHS Code of Conduct is part of our measures to deal with environmental, health and safety risks related to the Works. It applies to all our staff, laborers and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each JV Partner, Sub-Consultant and any other personnel assisting us in the execution of the Works. All such persons are referred to as "Consultant's Personnel" and are subject to this EHS Code of Conduct.

This EHS Code of Conduct identifies the behavior that we require from all Consultant's Personnel.

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

REQUIRED CONDUCT

Consultant's Personnel shall:

1. carry out his/her duties competently and diligently;
2. comply with this EHS Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Consultant's Personnel and any other person;
3. maintain a safe working environment including by:
 - (a) ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;
 - (b) wearing required personal protective equipment;
 - (c) using appropriate measures relating to chemical, physical and biological substances and agents; and
 - (d) following applicable emergency operating procedures.
4. report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health;
5. treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;
6. report violations of this EHS Code of Conduct; and
7. not retaliate against any person who reports violations of this EHS Code of Conduct, whether to us or the Employer, or who makes use of the grievance mechanism for Consultant's Personnel or the project's Grievance Redress Mechanism.

RAISING CONCERNS

If any person observes behavior that he/she believes may represent a violation of this EHS Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done by call [] to reach the Consultant's hotline (if any) and leave a message.

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. We take seriously all reports of possible

misconduct and will investigate and take appropriate action. We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

CONSEQUENCES OF VIOLATING THE ENVIRONMENTAL, HEALTH AND SAFETY CODE OF CONDUCT

Any violation of this EHS Code of Conduct by Consultant's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR CONSULTANT'S PERSONNEL

I have received a copy of this EHS Code of Conduct written in a language that I comprehend. I understand that if I have any questions about this EHS Code of Conduct, I can contact [enter name of Consultant's contact person(s) with relevant experience] requesting an explanation.

Name of Consultant's Personnel: [insert name]


Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Consultant:

Signature: _____

Date: (day month year): _____



APPENDIX B: KEY EXPERTS

S/No	Name	Nationality
	Position	Firm
A	INTERNATIONAL KEY EXPERTS	
K-1	Lim, Seon Taek Team Leader / Multidisciplinary Railway Specialist	Korean DOHWA
K-2	Hong, Kyung Wun Railway Alignment Expert	Korean DOHWA
K-3	Omari Kibwana Shikeli Geotechnical & Foundation Expert	Tanzania DOHWA
K-4	Yeo, Seung Ho Senior Signaling & Train Control Expert	Korean DOHWA
K-5	Mukarram Mahmud Sohul Institutional & Organizational Reform Specialist – Team Lead	Canadian DOHWA
K-6	Aliki Tsarouchi Railway Economist / Business Plan Specialist	Greece DOHWA
K-7	Lee, Sang Hyun Land & Real Estate Commercial Development Expert	Korean DOHWA
B	National KEY EXPERTS	
NK-1	Arshad Salam Khattak Deputy Team Leader / Senior Railway Engineer	Pakistani NEC
NK-2	Sameem Ul Islam Track & Alignment Engineer	Pakistani NEC
NK-3	Muhammad Shahid Alvi Institutional Reform Specialist	Pakistani NEC
NK-4	Muhammad Minhaj PPP / Commercialization	Pakistani NEC

Note: Signed CVs of all key/non-key experts are in client's file.

APPENDIX C: BREAKDOWN OF CONTRACT PRICE

S/No	Item	USD	PKR
1	Remuneration of Key Experts	973,986.0	100,261,810.0
2	Remuneration of Non-Key Experts	832,056.0	236,610,380.0
3	Reimbursable Expenses	106,357.0	324,476,417.0
4	Total (1 to 3)	1,912,399.0	661,348,607.0
5	Punjab Sales Tax on Services (PRA) @16% on Foreign and Local Component (Serial No. 4 above)	305,983.84	105,815,777.12
6	Additional Income Tax on Non-Residents Remuneration in Client's Country (15%) (Serial No. 1+2)	270,906.30	-
7	Total Amount of Tax (5 + 6)	576,890.14	105,815,777.12
8	Total Contract Price (4 + 7)	2,489,289.14	767,164,384.12

APPENDIX-C1: BREAKDOWN OF REMUNERATION COMPONENT OF THE CONTRACT PRICE										
No.	Name	Nationality	Currentcy	No.	Person-month Remuneration Rate (Home)	Time Input in		Total Person-Months	Foreign Component (USD)	Local Component (PKR)
						Person/Month (from TECH-6) (Home)	Person/Month (from TECH-6) (Field)			
A						International Key Experts				
K-1	Lim, Seon Taek Team Leader / Multidisciplinary	Korean	USD	1.00	25,480.0	4.0	4.0	4.0	101,920.0	
					26,980.0	8.0	8.0	8.0	215,840.0	

APPENDIX-C1: BREAKDOWN OF REMUNERATION COMPONENT OF THE CONTRACT PRICE											
No.	Name	Nationality	Currency	No.	Person-month Remuneration Rate		Time Input in Person/Month		Total Person-Months	Foreign Component (USD)	Local Component (PKR)
					(Home)	(Field)	(Home)	(Field)			
	Position				Person-month Remuneration Rate (Home)	Person-month Remuneration Rate (Field)	Time Input in Person/Month (Home)	Time Input in Person/Month (Field)			
	Railway Specialist										
K-2	Hong, Kyung Wun	Korean	USD	1.00	20,770.0		5.3		5.3	110,081.0	
	Railway Alignment Expert	DOHWA			21,860.0		0.7		0.7	15,302.0	
K-3	Omari Kibwana Shikeli	Tanzania	USD	1.00	9,950.0		2.6		2.6	25,870.0	
	Geotechnical & Foundation Expert	DOHWA			11,000.0		0.4		0.4	4,400.0	
K-4	Yeo, Seung Ho	Korean	USD	1.00	20,770.0		2.5		2.5	51,925.0	
	Senior Signaling & Train Control Expert	DOHWA			21,860.0		1.5		1.5	32,790.0	
K-5	Mukarram Mahmud Sohul	Canadian	USD	1.00	17,390.0		4.0		4.0	69,560.0	
	Institutional & Organizational Reform Specialist – Team Lead	DOHWA			19,760.0		8.0		8.0	158,080.0	
K-6	Ailiki Tsarouchi	Greece	USD	1.00	17,390.0		3.6		3.6	62,604.0	
	Railway Economist / Business Plan Specialist	DOHWA			19,760.0		2.4		2.4	47,424.0	
K-7	Lee, Sang Hyun	Korean	USD	1.00	14,870.0		3.0		3.0	44,610.0	
	Land & Real Estate Commercial Development Expert	DOHWA			16,790.0		2.0		2.0	33,580.0	
B	Sub-Total Key Experts (International)									973,986.00	
	National Key Experts										

APPENDIX-C1: BREAKDOWN OF REMUNERATION COMPONENT OF THE CONTRACT PRICE										
No.	Name	Nationality	Currency	No.	Person-month Remuneration Rate (Home)	Time Input in		Total Person-Months	Foreign Component (USD)	Local Component (PKR)
						(from TECH-6) (Home)	(Field)			
	Position	Firm			Person-month Remuneration Rate (Field)	Person-month Remuneration Rate (Field)				
NK-1	Arshad Salam Khattak	Pakistani	PKR	1.00	2,604,605.0	3.0	3.0	3.0		7,813,815.00
	Deputy Team Leader / Senior Engineer	NEC			2,604,605.0	15.0	15.0	15.0		39,069,075.00
NK-2	Sameem Ul Islam	Pakistani	PKR	1.00	2,470,765.0	1.2	1.2	1.2		2,964,918.00
	Track & Alignment Engineer	NEC			2,470,765.0	4.8	4.8	4.8		11,859,672.00
NK-3	Muhammad Shahid Alvi	Pakistani	PKR	1.00	2,556,968.0	1.5	1.5	1.5		3,835,452.00
	Institutional Reform Specialist	NEC			3,006,883.0	6.5	6.5	6.5		19,544,739.50
NK-4	Muhammad Minhaj	Pakistani	PKR	1.00	2,216,039.0	1.2	1.2	1.2		2,659,246.80
	PPP Commercialization	NEC			2,607,269.0	4.8	4.8	4.8		12,514,891.20
Sub-Total Key Experts (National)										100,261,810.0
C International Non-Key Experts										
NKI-1	Kim, Jungho	Korean	USD	1.00	17,900.00	5.0	5.0	5.0	89,500.00	
	Railway Track Design Specialist	DOHWA			18,840.00	1.0	1.0	1.0	18,840.00	
NKI-2	Kwon, Joon Myoung	Korean	USD	1.00	17,900.00	5.4	5.4	5.4	96,660.00	
	Senior Bridge & Structures Engineer	DOHWA			18,840.00	0.6	0.6	0.6	11,304.00	
NKI-3	Md Mahfuzul Hoque Maruf	Bangladeshi	USD	1.00	9,820.00	2.5	2.5	2.5	24,550.00	
	Telecom and ICT Expert	DOHWA			10,850.00	1.5	1.5	1.5	16,275.00	

APPENDIX-C1: BREAKDOWN OF REMUNERATION COMPONENT OF THE CONTRACT PRICE										
No.	Name	Nationality	Currency	No.	Person-month Remuneration		Total Person-Months	Foreign Component (USD)	Local Component (PKR)	
					Rate (Home)	Time Input in Person/Month (from TECH-6) (Home)				Rate (Field)
	Position		Firm							
NKI-4	Jin, Youngsuk	Korean	USD	1.00	16,920.00	4.2	4.2	71,064.00		
	Rolling Stock & Depot Engineering Expert	DOHWA			17,810.00	0.8	0.8	14,248.00		
NKI-5	Mr. Shin, Seung-Hun	Korean	USD	1.00	9,560.00	4.4	4.4	42,064.00		
	Railway Maintenance Specialist	DOHWA			10,550.00	0.6	0.6	6,330.00		
NKI-6	Jo, Hanbeom	Korean	USD	1.00	20,770.00	3.5	3.5	72,695.00		
	Electrical and Traction Power Expert	DOHWA			21,860.00	0.5	0.5	10,930.00		
NKI-7	Md Fahmidur Rahman	Bangladeshi	USD	1.00	9,180.00	3.6	3.6	33,048.00		
	Senior Environmental Safeguards Specialist	DOHWA			10,100.00	0.4	0.4	4,040.00		
NKI-8	Choi, Jong Bin	Korean	USD	1.00	20,770.00	4.2	4.2	87,234.00		
	Railway O&M Management Specialist	DOHWA			21,860.00	0.8	0.8	7,488.00		
NKI-9	Zahid Hussain	Pakistani	USD	1.00	8,550.00	5.4	5.4	6,170.00		
	Financial Management & IFRS Specialist	DOHWA			9,360.00	0.6	0.6	5,616.00		
NKI-10	Rovshan Badalov	Azerbaijani	USD	1.00	10,450.00	6.5	6.5	67,925.00		
	Senior Procurement & Contracts Specialist	DOHWA			11,590.00	2.5	2.5	28,975.00		
NKI-11	Ms. Nozipho Portia Mdawe	South African	USD	1.00	16,130.00	2.8	2.8	45,164.00		
	Freight & Commercialization	DOHWA			18,280.00	1.2	1.2	21,936.00		

APPENDIX-C1: BREAKDOWN OF REMUNERATION COMPONENT OF THE CONTRACT PRICE										
No.	Name	Nationality	Currency	No.	Person-month Remuneration Rate		Time Input in Person/Month (from TECH-6)	Total Person-Months	Foreign Component (USD)	Local Component (PKR)
					(Home)	(Field)				
	Position	Firm			Person-month Remuneration Rate (Home)	Person-month Remuneration Rate (Field)	Time Input in Person/Month (Home)	Time Input in Person/Month (Field)		
Specialist										
Sub-Total International Non-Key Experts										
D	National Non-Key Experts									
NAKN-1	Muhammad Khurshid	Nasir	Pakistani	PKR	1.00	1,802,453.00	1.0	1.0	1.0	1,802,453.00
	Geotechnical Engineer		NEC			1,802,453.00	3.0	3.0	3.0	5,407,359.00
NAKN-2	Muhammad Aftab	Mehroz	Pakistani	PKR	1.00	1,802,453.00	1.0	1.0	1.0	1,802,453.00
	Hydrology & Drainage Engineer		NEC			1,802,453.00	3.0	3.0	3.0	5,407,359.00
NAKN-3	Muhammad Javed	Tayseer	Pakistani	PKR	1.00	1,268,703.00	3.0	3.0	3.0	3,806,109.00
	CAD/GIS Technician & Document Controller-1		NEC			1,268,703.00	9.0	9.0	9.0	11,418,327.00
NAKN-4	Muhammad Iqbal		Pakistani	PKR	1.00	1,268,703.00	3.0	3.0	3.0	3,806,109.00
	CAD/GIS Technician & Document Controller-2		NEC			1,268,703.00	9.0	9.0	9.0	11,418,327.00
NAKN-5	Amir Ali Sangi		Pakistani	PKR	1.00	1,187,663.00	1.5	1.5	1.5	1,781,494.50
	Assistant Alignment Engineer	Track/	NEC			1,187,663.00	4.5	4.5	4.5	5,344,483.50
NAKN-6	Ghazanfar Mujtaba		Pakistani	PKR	1.00	1,212,813.00	1.0	1.0	1.0	1,212,813.00
	Drainage & Hydrology Engineer		NEC			1,212,813.00	3.0	3.0	3.0	3,638,439.00
NAKN-7	Mr. Zaheer Ullah		Pakistani	PKR	1.00	1,455,935.00	1.5	1.5	1.5	2,183,902.50
	S&T/Telecom Design		NEC			1,455,935.00	4.5	4.5	4.5	6,551,707.50

APPENDIX-C1: BREAKDOWN OF REMUNERATION COMPONENT OF THE CONTRACT PRICE										
No.	Name	Nationality	Currency	No.	Person-month Remuneration Rate (Home)	Time Input in Person/Month		Total Person-Months	Foreign Component (USD)	Local Component (PKR)
						(Home)	(Field)			
	Position				Person-month Remuneration Rate (Field)	Person-month Remuneration Rate (Home)	Person-month Remuneration Rate (Field)			
	Assistant									
NKN-8	Liaquat Ali Chughtai	Pakistani	PKR	1.00	1,534,181.00	1,534,181.00	1.5	1.5		2,301,271.50
	Rolling Stock/Depot Systems Analyst	NEC					4.5	4.5		6,903,814.50
NKN-9	Muhammad Maaz	Pakistani	PKR	1.00	1,212,813.00	1,212,813.00	2.0	2.0		2,425,626.00
	Transport Data Analyst / Research Associate-1	NEC					6.0	6.0		7,276,878.00
NKN-10	Muhammad Ayaz	Pakistani	PKR	1.00	1,212,813.00	1,212,813.00	2.0	2.0		2,425,626.00
	Transport Data Analyst / Research Associate-2	NEC					6.0	6.0		7,276,878.00
NKN-11	Naufil Shahrukh	Pakistani	PKR	1.00	1,534,181.00	1,534,181.00	1.5	1.5		2,301,271.50
	Institutional Research Officer	NEC					4.5	4.5		6,903,814.50
NKN-12	Hassan Rasool	Pakistani	PKR	1.00	1,668,317.00	1,668,317.00	1.5	1.5		2,502,475.50
	HR/Training Needs Analyst	NEC					4.5	4.5		7,507,426.50
NKN-13	Tanveer Anwar	Pakistani	PKR	1.00	1,400,045.00	1,400,045.00	1.5	1.5		2,100,067.50
	Financial Data Analyst	NEC					4.5	4.5		6,300,202.50
NKN-14	Ms. Tooba Feroz	Pakistani	PKR	1.00	1,268,703.00	1,268,703.00	1.5	1.5		1,903,054.50
	Freight Market/Logistics Analyst	NEC					4.5	4.5		5,709,163.50
NKN-15	Ijlal Farrukh	Pakistani	PKR	1.00	1,268,703.00	1,268,703.00	1.5	1.5		1,903,054.50
	Land/Asset Data & GIS Officer	NEC					4.5	4.5		5,709,163.50
NKN-	Rais Gul Muhammad	Pakistani	PKR	1.00	1,268,703.00	1,268,703.00	1.5	1.5		1,903,054.50

APPENDIX-C1: BREAKDOWN OF REMUNERATION COMPONENT OF THE CONTRACT PRICE										
No.	Name	Nationality	Currency	No.	Person-month Remuneration Rate (Home)	Time Input in Person/Month		Total Person-Months	Foreign Component (USD)	Local Component (PKR)
						(Home)	(Field)			
	Position		Firm		Person-month Remuneration Rate (Field)	Person-month Remuneration Rate (Home)	Person-month Remuneration Rate (Field)	Person-month Remuneration Rate (Home)		
16	Community Liaison & Stakeholder Engagement Officer	NEC			1,268,703.00		4.5	4.5		5,709,163.50
NKN-17	Muhammad Usman Civil/ Structural Engineer	Pakistani NEC	PKR	1.00	1,668,317.00		1.5	4.5		2,502,475.50 7,507,426.50
NKN-18	Muhammad Asif Signaling and Telecom Expert	Pakistani NEC	PKR	1.00	1,802,453.00		1.5	4.5		2,703,679.50 8,111,038.50
NKN-19	Affan Ali Shah Procurement and Contract Specialist	Pakistani NEC	PKR	1.00	1,802,453.00		2.5	7.5		4,506,132.50 13,518,397.50
NKN-20	Muzaffar Islam Legal & Regulatory Framework Specialist	Pakistani NEC	PKR	1.00	2,070,725.00		1.5	4.5		3,106,087.50 9,318,262.50
NKN-21	Hafiz Muhammad Tayyab Bhatti	Pakistani NEC	PKR	1.00	1,400,045.00		1.5	4.5		2,100,067.50 6,300,202.50
NKN-22	Ghulam Shabbir National Capacity Building & Training Specialist	Pakistani NEC	PKR	1.00	1,534,181.00		1.5	4.5		2,301,271.50 6,903,814.50
NKN-23	Sahibzada Ahmad	Pakistani	PKR	1.00	1,400,045.00		1.0	1.0		1,400,045.00

APPENDIX-C1: BREAKDOWN OF REMUNERATION COMPONENT OF THE CONTRACT PRICE										
No.	Name	Nationality	Currency	No.	Person-month Remuneration Rate (Home)	Time Input in Person/Month (from TECH-6)		Total Person-Months	Foreign Component (USD)	Local Component (PKR)
						(Home)	(Field)			
	Position	Firm			Person-month Remuneration Rate (Field)	Person-month Remuneration Rate (Home)	Person/Month (Home)	Person/Month (Field)		
	O&M Process Improvement Engineer	NEC			1,400,045.00		3.0			4,200,135.00
NKN-24	Omar Niaz Rizvi	Pakistani	PKR	1.00	1,668,317.00		1.0			1,668,317.00
	Financial Analyst	NEC			1,668,317.00		3.0			5,004,951.00
NKN-25	Ms. Rizwana Anjum	Pakistani	PKR	1.00	1,802,453.00		1.5			2,703,679.50
	Environmental & Social Specialist	NEC			1,802,453.00		4.5			8,111,038.50
Sub-Total National Non-Key Experts										236,610,364.0
TOTAL Remuneration Price (C1) =										1,806,042.0

APPENDIX C: BREAKDOWN OF CONTRACT PRICE

APPENDIX C2: Breakdown of Reimbursable and Provisional Sums components of Contract Price						
Type of Expenses	Unit	Quantity	Unit Rate	Currency	Amount (USD)	Amount (PKR)
Reimbursable Expenses						
Per Diem Allowances for International Experts	Day	798	88	USD	70,224.00	
International Flights (Round-Trip)	RT	25	849	USD	21,225.00	
Miscellaneous Travel Expenses for International Experts (including in / Out Airport Transportation)	RT	25	196	USD	4,900.00	
Rental Office (Lahore) including Utility Bills	Months	18	2,275,966	PKR		40,967,388.00
Residence (Lahore) including Utility Bills [Foreigners]	Months	18	556	USD	10,008.00	
Residence (Lahore) including Utility Bills [Locals]	Months	18	1,528,592	PKR		27,514,656.00
National Flights (Round-Trip)	RT	30	97,808	PKR		2,934,240.00
Rental of Vehicles (including POL, Maintenance, Drivers etc. comprising four (04) vehicles for PIU use)	Vehicle-Months	324	62,100	PKR		20,120,400.00
Communication Cost (Lahore)	Months	18	234,738	PKR		4,225,284.00
Office Stationery Costs as per the requirement of the assignment	Months	18	260,587	PKR		4,690,566.00
Reproduction of Reports	Lump Sum	1	4,191,752	PKR		4,191,752.00
Computer Stationery, Toner, Disk, CD etc. as per the requirement of the assignment	Lump Sum	1	6,382,640	PKR		6,382,640.00
Insurances	Lump Sum	1	19,561,507	PKR		19,561,507.00
Equipment, Fixtures and Furniture as per the requirement of the assignment	Lump Sum	1	65,281,555	PKR		65,281,555.00
Social/ Market Surveys as per the requirement of TORs	Lump Sum	1	4,610,927	PKR		4,610,927.00
Workshops and Seminars as per	Lump	1	8,294,079	PKR		8,294,079.00

APPENDIX C2: Breakdown of Reimbursable and Provisional Sums components of Contract Price						
Type of Expenses	Unit	Quantity	Unit Rate	Currency	Amount (USD)	Amount (PKR)
requirement of TORs	Sum					
Capacity Building & Training Programs as per the requirement of the TORs	Lump Sum	1	3,996,136	PKR		3,996,136.00
Supporting Staffs	Lump Sum	1	102,673,460	PKR		102,673,460.00
Climate Resilience Design Verification Report	Lump Sum	1	2,012,041	PKR		2,012,041.00
Land Acquisition and Resettlement Review	Lump Sum	1	4,001,725	PKR		4,001,725.00
Hydrological investigation and Analysis	Lump Sum	1	3,018,061	PKR		3,018,061.00
Sub-Total: Reimbursable Expenses					106,357.0	324,476,417.0
Total Reimbursable Expenses (C2) =					106,357.0	324,476,417.0

**Model Form I
Breakdown of Agreed Fixed Rates in Consultant's Contract**

We hereby confirm that we have agreed to pay to the Experts listed, who will be involved in performing the Services, the basic fees and away from the home office allowances (if applicable) indicated below:

(Expressed in [insert name of currency])*

Experts		1	2	3	4	5	6	7	8
Name	Position	Basic Remuneration rate per Working Month/Day/Year	Social Charges ¹	Overhead ¹	Subtotal	Profit ²	Away from Home Office Allowance	Agreed Fixed Rate per Working Month/Day/Hour	Agreed Fixed Rate per Working Month/Day/Hour ¹
Home Office									
Work in the Client's Country									

1 Expressed as percentage of 1

2 Expressed as percentage of 4

* If more than one currency, add a table

Signature _____

Date _____

Name and Title: _____

APPENDIX D: FORM OF ADVANCE PAYMENTS GUARANTEE

[Note: See Clause GCC 41.2.1 and SCC 41.2.1]

[Insert Guarantor Letterhead or SWIFT Identifier code]

Bank Guarantee for Advance Payment

Guarantor: _____ *[insert commercial Bank's Name, and Address of Issuing Branch or Office]*

Beneficiary: _____ *[name and address of Client]*

Date: _____ *[insert date]*

ADVANCE PAYMENT GUARANTEE No.: _____ *[insert number]*

We have been informed that _____ *[insert name of Consultant or a name of the Joint Venture, same as appears on the signed Contract]* (hereinafter called "the Consultant") has entered into Contract No. _____ *[insert reference number of the contract]* dated _____ *[insert date]* with the Beneficiary, for the provision of _____ *[insert brief description of Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum of _____ *[insert amount in figures]* (_____ *[insert amount in words]*) is to be made against an advance payment guarantee.

At the request of the Consultant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ *[insert amount in figures]* (_____ *[insert amount in words]*)¹ upon our receipt of the Beneficiary's complying demand supported by the Beneficiary's written statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Consultant is in breach of their obligation under the Contract because the Consultant has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount that the Consultant has failed to repay.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to here must have been received by the Consultant on their account number _____ at _____ *[insert name and address of bank]*.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Consultant as indicated in certified statements or invoices

¹ The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Client.

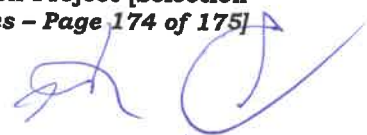
marked as "paid" by the Client that shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of the payment certificate or paid invoice indicating that the Consultant has made full repayment of the amount of the advance payment, or on the ___ day of _____ [month], _____ [year],² whichever is earlier. Consequently, we must receive any demand for payment under this guarantee at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 revision, ICC Publication No. 758.

[Signature(s)]

Note: All italicized text is for indicative purposes only to assist in preparing this form and shall be deleted from the final product.

² Insert the expected expiration date. In the event of an extension of the time for completion of the Contract, the Client would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Client might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [6 months][1 year], in response to the Client's written request for such extension, and this request shall be presented to the Guarantor before the expiry of the guarantee."



APPENDIX E: MINUTES OF CONTRACT NEGOTIATIONS

