

KPRRDP/OCB/CW-07

**PACKAGE-7: REHABILITATION AND IMPROVEMENT OF
FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT
CHITRAL IO2-LOTS1**

INVITATIONS FOR BIDS



Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar



Invitation for Bids

Date:	22 February 2025
Loan No. and Title:	Loan 4482-PAK & Loan 4483-PAK: Khyber Pakhtunkhwa Rural Roads Development Project
Contract No. and Title:	KPRRDP/OCB/CW-07: Package-7: Rehabilitation and Improvement of Flood Affected and Tourism Roads in District Chitral [02-Lots] ➤ <u>Lot-1:</u> <i>Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral</i> ➤ <u>Lot-2:</u> <i>Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral</i>
Deadline for Submission of Bids:	11:00 hours (Pakistan Standard Time) on 24 March 2025

1. The **Islamic Republic of Pakistan** has received financing from the Asian Development Bank (ADB) towards the cost of **Khyber Pakhtunkhwa Rural Roads Development Project**. Part of this financing will be used for payments under the contracts named hereunder. Bidding is open to all Bidders, who can prove their eligibility and qualification as mentioned hereunder and in the Bidding Document(s), from eligible source countries of the ADB.
2. The **Communication and Works Department (C&WD)** (“the Employer”) invites sealed bids from eligible Bidders for the lot/lots as mentioned above (“the Works”). Bidders may submit separate bids for one or both lots. However, a bidder may be awarded one or both lots if it submits the lowest evaluated substantially responsive bid(s) provided such bidder meets the aggregated qualification requirements for one or both lots.
3. **Open Competitive Bidding** (international advertisement) will be conducted in accordance with the ADB’s [Single- Stage: Two-Envelope](#) bidding procedure and is open to all eligible Bidders as described in the Bidding Document.
4. National Bidders are required to be registered with Pakistan Engineering Council with a valid registration Certification in Category as mentioned in Section 3 of the Bidding Document.
5. Only eligible Bidders with the following main key qualifications should participate in this bidding:

Contract No.	Description of Package	Participation in at least one contract that has been successfully or substantially completed within the last five (05) years and that is similar to the proposed works, where the value of the Bidder's participation exceeds amounts mentioned below. The similarity of the Bidder's participation shall be based on the physical size, nature of works, complexity, methods, technology or other characteristics as described in Section 6, Employer's Requirements of the Bidding Documents.	The bidder should have a minimum Average Annual Construction Turnover as mentioned below) calculated as total certified payments received from contracts in progress or completed, within the last three (03) years .	The bidder should have cash flow requirement
Lot-1	Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral	PKR 3,771.00 million or US\$ equivalent	PKR 4,714.00 million or US\$ equivalent	PKR 786.0 million or US\$ equivalent
Lot-2	Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral	PKR 3,955.00 million or US\$ equivalent	PKR 4,943.00 million or US\$ equivalent	PKR 824.00 million or US\$ equivalent

If there are any discrepancies between this Invitation for Bid and the Bidding Document, the Bidding Document shall prevail.

6. To obtain further information and inspect the Bidding Documents, Bidders should contact **Project Implementation Unit, ADB Assisted Projects, Communication and Works Department, Peshawar** at the address mentioned below.
7. To purchase the Bidding Documents in English, eligible Bidders should:
 - Write to address mentioned below requesting the bidding document as mentioned above.
 - Pay a non-refundable fee of PKR 15,000/- (Pak Rupees Fifteen Thousand Only) or US\$ 60 (US Dollars Sixty Only) by Pay Order / Demand Draft for each lot in favour of **Project Director, PIU, ADB Assisted Projects, C&W Department Peshawar**.
 - The eligible bidders also have the option to download the bidding document at no cost from C&WD and PIU websites i.e., <https://cwd.gkp.pk> and <https://priip.gkp.pk>. Eligible

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 Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

bidders opting to download the bidding document from C&WD and PIU websites shall inform PIU, ADB Assisted Projects, C&WD in writing at the address given below failing which PIU, ADB Assisted Projects, C&WD shall not be responsible if the bidder does not receive clarifications and amendments, if any. In case of any discrepancy between the downloaded document and hard copy, the latter shall prevail.

- The documents may be collected in person at the address mentioned below or may be delivered for an additional fee of PKR 5000/- (Pak Rupees Five Thousand Only) for domestic delivery by express airmail or US\$ 100 (US Dollars One Hundred Only) for overseas delivery. No liability will be accepted for loss in transit or late delivery.
8. A pre-bid meeting shall take place on **06 March 2025 at 11:00 hours (Pakistan Standard Time)** at the address mentioned below:
9. Deliver your bid(s):
- To the address
- Project Director**
Project Implementation Unit (PIU)
ADB Assisted Projects
Communication and Works Department (C&WD)
Government of Khyber Pakhtunkhwa,
Address: House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa, Pakistan
- On or before the deadline at **1100 hours (Pakistan Standard Time) 24 March 2025.**
 - Together with a Bid Securing Declaration as described in the Bidding Document(s).
10. Electronic submission of Bids is not allowed, and late bids will not be accepted.
11. Technical Bids will be opened on **24 March 2025 at 11:05 (Pakistan Standard Time)** in the presence of bidders' representative who choose to attend, whereas the Financial Bids shall remain sealed and unopened and shall be placed locked. The Price Bids of only Technically Responsive and Qualified Bidders shall be opened after technical bids evaluation, whereas the price bids of those bidders whose technical bids are not responsive and not qualified shall be returned unopened.

Project Director

Project Implementation Unit

ADB Assisted Projects

Communication and Works Department

Government of Khyber Pakhtunkhwa,

Address: House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa, Pakistan

Telephone: +92-91-9216356

Fax: +92 91 9212443

E-mail address: pdprp.pkha@gmail.com

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Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

KPRRDP/OCB/CW-07

**PACKAGE-7: REHABILITATION AND IMPROVEMENT OF
FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT
CHITRAL IO2-LOTS1**

BIDDING DOCUMENTS



Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

**ISLAMIC REPUBLIC OF PAKISTAN
COMMUNICATION AND WORKS DEPARTMENT
GOVERNMENT OF KHYBER PAKHTUNKHWA**



**ASIAN DEVELOPMENT BANK
LOAN P54048-001-PAK:
KHYBER PAKHTUNKHWA RURAL ROADS
DEVELOPMENT PROJECT**

(KPRRDP/OCB/CW-07)

**BIDDING DOCUMENT
Procurement of Works**

- Single-Stage: Two-Envelope Bidding Procedure -

**KPRRDP/OCB/CW-07: PACKAGE-7:
REHABILITATION AND IMPROVEMENT OF
FLOOD AFFECTED AND TOURISM ROADS IN
DISTRICT CHITRAL [02-LOTS]**

- **Lot-1: Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral**
- **Lot-2: Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral**

Project Implementation Unit (PIU)

Khyber Pakhtunkhwa Rural Roads Development Project (KP-RRDP)

Communication and Works Department (C&WD)

Government of Khyber Pakhtunkhwa (GoKP)

Address: PIU, KP PRIP-C&WD, House No. 24, C/3 Circular Road

University Town Peshawar Khyber Pakhtunkhwa Pakistan

☎ +92-91-9216459, E-mail: pdprrp.pkha@gmail.com

PROCUREMENT OF WORKS

**Bidding Document for
Procurement of
KPRRDP/OCB/CW-07: PACKAGE-7:
**REHABILITATION AND IMPROVEMENT OF
FLOOD AFFECTED AND TOURISM ROADS IN
DISTRICT CHITRAL [02-LOTS]****

- *Lot-1: Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral*
- *Lot-2: Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral*

Issued on: 21 February 2025
Invitation for Bids No.: KPRRDP/OCB/CW-07
OCB No.: KPRRDP/OCB/CW-07
Employer: Project Implementation Unit
Khyber Pakhtunkhwa Rural Roads
Development Project
Communication and Works
Department
Government of Khyber Pakhtunkhwa
Country: Pakistan

Preface

This Bidding Document for the Procurement of Works has been prepared by **Communication and Works Department Khyber Pakhtunkhwa through Project Director, PIU, KP-RRDP, C&WD** and is based on the Standard Bidding Document for the Procurement of Works–Small Contracts (*SBD Works-Small*) issued by the Asian Development Bank dated **[December 2021]**.

ADB's *SBD Works-Small* has the structure, and the provisions of the Master Procurement Document entitled "Bidding Documents for the Procurement of Works–Small Contracts", prepared by multilateral development banks and other public international financial institutions except where ADB-specific considerations have required a change.

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Section 1: Instructions to Bidders

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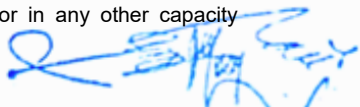
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A. General	
1. Scope of Bid	<p>1.1 In connection with the Invitation for Bids (IFB) indicated in the Bid Data Sheet (BDS), the Employer, as indicated in the BDS, issues this Bidding Document for the procurement of the Works as specified in Section 6 (Employer's Requirements). The name, identification, and number of contracts of this bidding are provided in the BDS.</p>
	<p>1.2 Throughout this Bidding Document,</p> <p>(a) the term "in writing" means communicated in written form and delivered against receipt;</p> <p>(b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and</p> <p>(c) "day" means calendar day.</p>
2. Source of Funds	<p>2.1 The Borrower or Recipient (hereinafter called "Borrower") indicated in the BDS has applied for or received financing (hereinafter called "funds") from the Asian Development Bank (hereinafter called "ADB") toward the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.</p>
	<p>2.2 Payments by ADB will be made only at the request of the Borrower and upon approval by ADB in accordance with the terms and conditions of the Financing Agreement between the Borrower and ADB (hereinafter called "Financing Agreement"), and will be subject in all respects to the terms and conditions of that Financing Agreement. No party other than the Borrower shall derive any rights from the Financing Agreement or have any claim to the funds.</p>
3. Fraud and Corruption	<p>3.1 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, and Contractors, agents, subcontractors, subconsultants, service providers, subsuppliers, manufacturers (including their respective officers, directors, employees and personnel) under ADB-financed contracts to observe the highest standard of ethics during the procurement and execution of such contracts in accordance with ADB's Anticorruption Policy (1998, as amended from time to time). In pursuance of this policy, ADB</p> <p>(a) defines, for the purposes of this provision, the terms set forth below as follows:</p> <p>(i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;</p> <p>(ii) "fraudulent practice" means any act 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;</p> <p>(iii) "coercive practice" means impairing or harming, or</p>

	<p>threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;</p> <p>(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;</p> <p>(v) "abuse" means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard;</p> <p>(vi) "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations; and</p> <p>(vii) "integrity violation" is any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to (vi) above and the following: obstructive practice, 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 standard.</p> <p>(b) will reject a proposal for award if it determines that the Bidder recommended for award or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;</p> <p>(c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of ADB financing 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;</p> <p>(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, 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; and</p>
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¹ Whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).



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	<p>(e) will have the right to require that a provision be included in bidding documents and in contracts financed, administered, or supported by ADB, requiring Bidders, suppliers, and contractors, consultants, manufacturers, service providers 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 the site and their assets, accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.</p>
	<p>3.2 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:</p> <p>(a) being available to be interviewed and replying fully and truthfully to all questions asked;</p> <p>(b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;</p> <p>(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;</p> <p>(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);</p> <p>(e) cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and</p> <p>(f) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.</p>
	<p>3.3 All Bidders, consultants, contractors and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in its contracts with its subconsultants, Subcontractors and other third parties engaged or involved in ADB-related activities, such subconsultants, Subcontractors and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.</p>
	<p>3.4 The Employer 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 Bidder or any of its Joint Venture partners, as appropriate, is, or is owned (in whole or in part)</p>


	by a person or entity subject to applicable sanctions.
	3.5 Furthermore, Bidders shall be aware of the provisions of GCC 28.3 and 73.2 (i).
4. Eligible Bidders	<p>4.1 A Bidder may be a natural person, private entity, or government-owned enterprise subject to ITB 4.5 – or any combination of them with a formal intent to enter into an agreement or under an existing agreement in the form of a Joint Venture. In the case of a Joint Venture:</p> <p>(a) all partners shall be jointly and severally liable; and</p> <p>(b) the Joint Venture shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the Joint Venture during the bidding process and, in the event the Joint Venture is awarded the Contract, during contract execution.</p> <p>4.2 A Bidder, and all parties constituting the Bidder, shall have the nationality of an eligible country, in accordance with Section 5 (Eligible Countries). A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed Subcontractors or Suppliers for any part of the Contract including related services.</p> <p>4.3 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if any of, including but not limited to, the following apply:</p> <p>(a) they have controlling shareholders in common; or</p> <p>(b) they receive or have received any direct or indirect subsidy from any of them; or</p> <p>(c) they have the same legal representative for purposes of this bid; or</p> <p>(d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the Bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or</p> <p>(e) a Bidder participates in more than one bid in this bidding process, either individually or as a partner in a Joint Venture, except for alternative offers permitted under ITB 13 of the Bidding Document. This will result in the disqualification of all Bids in which it is involved. However, subject to any finding of a conflict of interest in terms of ITB 4.3 (a)-(d) above, this does not limit the participation of a Bidder as a Subcontractor in another Bid or of a firm as a Subcontractor in more than one Bid; or</p> <p>(f) a Bidder, Joint Venture partner, associates, parent company, or any affiliated entity, participated as a Consultant in the preparation of the design or technical specifications of the works that are the</p>

	<p>subject of the Bid; or</p> <p>(g) a Bidder was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the contract; or</p> <p>(h) a Bidder would be providing goods, works, or nonconsulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the BDS ITB 2.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm; or</p> <p>(i) a Bidder that has a financial or familial relationship with staff of the Employer including project implementing/executing agency, or of a recipient of a part of the loan who: (i) are directly or indirectly involved in the preparation of the bidding documents or specifications of the contract, and/or the bid evaluation process of such contract; or (ii) would be involved in the implementation or supervision of such contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to ADB throughout the procurement process and execution of the contract.</p>
	<p>4.4 A firm will not be eligible to participate in any procurement activities under an ADB-financed, -administered, or -supported project while under temporary suspension or debarment by ADB pursuant to its Anticorruption Policy (see ITB 3), whether such debarment was directly imposed by ADB, or enforced by ADB pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporarily suspended or debarred firm will be rejected and such bid may be in breach of debarment conditions, thereby subject to further ADB's investigation.</p>
	<p>4.5 Government-owned enterprises in the Employer's country shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under commercial law, and (iii) are not a dependent agency of the Employer.</p>
	<p>4.6 A Bidder shall not be under suspension from Bidding by the Employer as the result of the execution of a Bid-Securing Declaration.</p>
	<p>4.7 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.</p>
	<p>4.8 Bidders shall be excluded if, 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, or payments to, a particular country, person or entity in respect of goods or services originating in that country. Where the Borrower's country prohibits payments to a particular person or entity or for particular goods or services by such an act of compliance, that firm shall be excluded.</p>
<p>5. Eligible Materials, Equipment and</p>	<p>5.1 The materials, equipment, and services to be supplied under the Contract shall have their origin in eligible source countries as defined</p>

Services	in ITB 4.2 above and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, Bidders may be required to provide evidence of the origin of materials, equipment, and services.
	5.2 For purposes of ITB 5.1 above, "origin" means the place where the materials and equipment are mined, grown, produced, or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.
B. Contents of Bidding Document	
6. Sections of Bidding Document	<p>6.1 The Bidding Document consists of Parts I, II, and III, which include all the sections indicated below, and should be read in conjunction with any addenda issued in accordance with ITB 8.</p> <p>PART I Bidding Procedures</p> <p style="padding-left: 40px;">Section 1 Instructions to Bidders (ITB)</p> <p style="padding-left: 40px;">Section 2 Bid Data Sheet (BDS)</p> <p style="padding-left: 40px;">Section 3 Evaluation and Qualification Criteria (EQC)</p> <p style="padding-left: 40px;">Section 4 Bidding Forms (BDF)</p> <p style="padding-left: 40px;">Section 5 Eligible Countries (ELC)</p> <p>PART II Requirements</p> <p style="padding-left: 40px;">Section 6 Employer's Requirements (ERQ)</p> <p>PART III Conditions of Contract and Contract Forms</p> <p style="padding-left: 40px;">Section 7 General Conditions of Contract (GCC)</p> <p style="padding-left: 40px;">Section 8 Particular Conditions of Contract (PCC)</p> <p style="padding-left: 40px;">Section 9 Contract Forms (COF)</p>
	6.2 The IFB issued by the Employer is not part of the Bidding Document.
	6.3 The Employer is not responsible for the completeness of the Bidding Document and their Addenda, if they were not obtained directly from the source stated by the Employer in the IFB.
	6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the bid.
7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting	7.1 A prospective Bidder requiring any clarification on the Bidding Document shall contact the Employer in writing at the Employer's address indicated in the BDS or raise his inquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such


	request is received prior to the deadline for submission of bids, within a period given in the BDS. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 22.2.
	7.2 The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself, on its own risk and responsibility, all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.
	7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
	7.4 The Bidder's designated representative is invited to attend a pre-bid meeting, if provided for in the BDS. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
	7.5 The Bidder is requested to submit any questions in writing, to reach the Employer not later than 1 week before the meeting.
	7.6 Minutes of the pre-bid meeting, including the text of the questions raised, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.
	7.7 Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.
8. Amendment of Bidding Document	8.1 At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding Document by issuing addenda.

	8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the Employer in accordance with ITB 6.3.
	8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may, at its discretion, extend the deadline for the submission of Bids, pursuant to ITB 22.2.
C. Preparation of Bids	
9. Cost of Bidding	9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
10. Language of Bid	10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in the language specified in the BDS. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.
11. Documents Comprising the Bid	11.1 The Bid shall comprise two envelopes submitted simultaneously, one called the Technical Bid containing the documents listed in ITB 11.2 and the other the Price Bid containing the documents listed in ITB 11.3, both envelopes enclosed together in an outer single envelope.
	11.2 The Technical Bid shall comprise the following: <ul style="list-style-type: none"> (a) Letter of Technical Bid; (b) Bid Security or Bid-Securing Declaration, in accordance with ITB 19; (c) alternative Bids, at Bidder's option and if permissible, in accordance with ITB 13; (d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.2; (e) documentary evidence in accordance with ITB 17, establishing the Bidder's qualifications to perform the contract; (f) Technical Proposal in accordance with ITB 16; (g) any other document required in the BDS.
	11.3 The Price Bid shall comprise the following: <ul style="list-style-type: none"> (a) Letter of Price Bid; (b) completed Price Schedules, in accordance with ITB 12 and ITB 14, or as stipulated in the BDS;


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	<p>(c) alternative price Bids, at Bidder's option and if permissible, in accordance with ITB 13;</p> <p>(d) any other document required in the BDS.</p>
	<p>11.4 In addition to the requirements under ITB 11.2, Bids submitted by a Joint Venture shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful Bid shall be signed by all partners and submitted with the Bid, together with a copy of the proposed agreement.</p>
12. Letters of Bid and Schedules	<p>12.1 The Letters of Technical Bid and Price Bid, and the Schedules, and all documents listed under Clause 11, shall be prepared using the relevant forms furnished in Section 4 (Bidding Forms). The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested and as required in the BDS.</p>
13. Alternative Bids	<p>13.1 Unless otherwise indicated in the BDS, alternative Bids shall not be considered.</p>
	<p>13.2 When alternative times for completion are explicitly invited, a statement to that effect will be included in the BDS, as will the method of evaluating different times for completion.</p>
	<p>13.3 When specified in the BDS pursuant to ITB 13.1, and subject to ITB 13.4 below, Bidders wishing to offer technical alternatives to the requirements of the Bidding Document must first price the Employer's design as described in the Bidding Document and shall further provide all information necessary for a complete evaluation of the alternative by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.</p>
	<p>13.4 When specified in the BDS, Bidders are permitted to submit alternative technical solutions for specified parts of the Works. Such parts will be identified in the BDS and described in Section 6 (Employer's Requirements). The method for their evaluation will be stipulated in Section 3 (Evaluation and Qualification Criteria).</p>
14. Bid Prices and Discounts	<p>14.1 The prices and discounts quoted by the Bidder in the Letter of Price Bid and in the Schedules shall conform to the requirements specified below.</p>
	<p>14.2 The Bidder shall submit a bid for the whole of the works described in ITB 1.1 by filling in prices for all items of the Works, as identified in Section 4 (Bidding Forms). In case of admeasurement contracts, the Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities. Unit rates and prices for all items of the Works described in the Bill of Quantities shall be expressed in positive values.</p>


	If unit rates and prices are expressed in negative values, the bid will be rejected.
	14.3 The price to be quoted in the Letter of Price Bid shall be the total price of the Bid, excluding any discounts offered. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.
	14.4 The Bidder shall quote any discounts and the methodology for their application in the Letter of Price Bid, in accordance with ITB 12.1.
	14.5 The prices shall be either fixed or adjustable as specified in the BDS. (a) In the case of Fixed Price, prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account. A Bid submitted with an adjustable price will be treated as nonresponsive and rejected. (b) In the case of Adjustable Price, prices quoted by the Bidder shall be subject to adjustment during performance of the contract to reflect changes in the cost elements such as labor, material, transport, and contractor's equipment in accordance with the provisions of the Conditions of Contract. A Bid submitted with a fixed price will be treated as nonresponsive and be rejected. The Bidder shall furnish the indexes and weightings for the price adjustment formulas in the Tables of Adjustment Data included in Section 4 (Bidding Forms) and the Employer may require the Bidder to justify its proposed indexes and weightings. Any bid that omits indexes and weightings shall be subject to clarification with the Bidder.
	14.6 If so indicated in ITB 1.1, bids are being invited for individual contracts or for any combination of contracts (packages). Bidders wishing to offer any price reduction for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Price reductions or discounts shall be submitted in accordance with ITB 14.4, provided the Bids for all contracts are submitted and opened at the same time.
	14.7 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.
15. Currencies of Bid and Payment	15.1 The currency(ies) of the Bid and payment shall be as specified in the BDS.
	15.2 Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the prices shown in the appropriate form(s) of Section 4, in which case a detailed breakdown of the foreign currency requirements shall be provided by Bidders.
16. Documents	16.1 The Bidder shall furnish a Technical Proposal including a statement of



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Comprising the Technical Proposal	work methods, equipment, personnel, schedule, environmental, health and safety (EHS) management plan commensurate with the proposed scope of works, EHS Code of Conduct, and any other information as stipulated in Section 4 (Bidding Forms), in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time.
17. Documents Establishing the Qualifications of the Bidder	17.1 To establish its qualifications to perform the Contract in accordance with Section 3 (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding information sheets included in Section 4 (Bidding Forms).
	17.2 Domestic Bidders, individually or in Joint Ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility in accordance with ITB 35.
18. Period of Validity of Bids	18.1 Bids shall remain valid for the bid validity period specified in the BDS. The bid validity period starts from the date fixed for the bid submission deadline date prescribed by the Employer in accordance with ITB 22.1. A bid valid for a shorter period shall be rejected by the Employer as nonresponsive.
	18.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 19, it shall also be extended 28 days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its Bid.
19. Bid Security/Bid-Securing Declaration	19.1 Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, in original form, either a Bid-Securing Declaration or a bid security as specified in the BDS. In the case of a bid security, the amount and currency shall be as specified in the BDS.
	19.2 If a Bid-Securing Declaration is required pursuant to ITB 19.1, it shall use the form included in Section 4 (Bidding Forms). The Employer will declare a Bidder ineligible to be awarded a Contract for a specified period of time, as indicated in the BDS, if the Bid-Securing Declaration is executed.
	19.3 If a bid security is specified pursuant to ITB 19.1, the bid security shall be, at the Bidder's option, in any of the following forms: <ul style="list-style-type: none"> (a) an unconditional bank guarantee (hard copy of the bank guarantee or in the form of SWIFT message MT760), or (b) an irrevocable letter of credit, or (c) a cashier's or certified check. <p>all from a reputable bank from an eligible country as described in Section 5 (Eligible Countries). In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section 4 (Bidding Forms) or another form acceptable to the Employer. The form must include the complete name of the Bidder.</p>

	<p>The bid security shall be valid for 28 days beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 18.2.</p>
	<p>19.4 Unless otherwise specified in the BDS, any Bid not accompanied by a substantially compliant bid security or Bid-Securing Declaration, if one is required in accordance with ITB 19.1, shall be rejected by the Employer as nonresponsive.</p>
	<p>19.5 If a bid security is specified pursuant to ITB 19.1, the bid security of substantially nonresponsive Technical Bids shall be returned before opening the Price Bids. The bid security of unsuccessful Bidders at Price Bid evaluation shall be returned promptly upon the successful Bidder's furnishing of the performance security pursuant to ITB 45.</p>
	<p>19.6 If a bid security is specified pursuant to ITB 19.1, the bid security of the successful Bidder shall be returned promptly once the successful Bidder has signed the Contract and furnished the required performance security.</p>
	<p>19.7 The bid security may be forfeited or the Bid-Securing Declaration executed, if</p> <ul style="list-style-type: none"> (a) notwithstanding ITB 24.3, a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid, except as provided in ITB 18.2; or (b) the successful Bidder fails to <ul style="list-style-type: none"> (i) sign the Contract in accordance with ITB 44; (ii) furnish a performance security in accordance with ITB 45; (iii) accept arithmetical corrections in accordance with ITB 34; or (iv) furnish a domestic preference security, if applicable, in accordance with ITB 45.
	<p>19.8 If the bid security is required as per ITB 19.1, the bid security of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the bid security shall be in the name of any or all of the Joint Venture partners. If the Bid-Securing Declaration is required as per ITB 19.1, the Bid-Securing Declaration of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the Bid-Securing Declaration shall be in the names of all future partners as named in the letter of intent mentioned in ITB 4.1.</p>
<p>20. Format and Signing of Bid</p>	<p>20.1 The Bidder shall prepare one original set of the Technical Bid and one original of the Price Bid comprising the Bid as described in ITB 11 and clearly mark it "ORIGINAL - TECHNICAL BID" and "ORIGINAL - PRICE BID." Alternative Bids, if permitted in accordance with ITB 13, shall be clearly marked "ALTERNATIVE." In addition, the Bidder shall submit copies of the Bid in the number specified in the BDS, and clearly mark each of them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.</p>




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	<p>20.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. If a Bidder submits a deficient authorization, the Bid shall not be rejected in the first instance. The Employer shall request the Bidder to submit an acceptable authorization within the number of days as specified in the BDS. Failure to provide an acceptable authorization within the period stated in the Employer's request shall cause the rejection of the Bid. If either the Letter of Technical Bid or Letter of Price Bid or the Bid-Securing Declaration (if applicable) is not signed, the Bid shall be rejected.</p>
	<p>20.3 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.</p>
<p>D. Submission and Opening of Bids</p>	
<p>21. Sealing and Marking of Bids</p>	<p>21.1 Bidders shall submit their Bids as specified in the BDS. Procedures for submission, sealing, and marking are as follows:</p> <p>(a) Bidders submitting Bids by mail or by hand shall enclose the original of the Technical Bid, the original of the Price Bid, and each copy of the Technical Bid and each copy of the Price Bid, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL - TECHNICAL BID," "ORIGINAL - PRICE BID," and "COPY NO... - TECHNICAL BID," and "COPY NO.... - PRICE BID." These envelopes, the first containing the originals and the others containing copies, shall then be enclosed in one single envelope per set. If permitted in accordance with ITB 13, alternative Bids shall be similarly sealed, marked and included in the sets. The rest of the procedure shall be in accordance with ITB 21.2 and ITB 21.3.</p> <p>(b) Bidders submitting Bids electronically shall follow the electronic bid submission procedures specified in the BDS.</p>
	<p>21.2 The inner and outer envelopes shall</p> <p>(a) bear the name and address of the Bidder;</p> <p>(b) be addressed to the Employer as provided in BDS 22.1; and</p> <p>(c) bear the specific identification of this bidding process indicated in the BDS 1.1.</p>
	<p>21.3 The outer envelopes and the inner envelopes containing the Technical Bid shall bear a warning not to open before the time and date for the opening of Technical Bid, in accordance with ITB 25.1.</p>
	<p>21.4 The inner envelopes containing the Price Bid shall bear a warning not to open until advised by the Employer in accordance with ITB 25.7.</p>

	21.5 If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.
22. Deadline for Submission of Bids	22.1 Bids must be received by the Employer at the address and no later than the date and time indicated in the BDS.
	22.2 The Employer may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.
23. Late Bids	23.1 The Employer shall not consider any Bid that arrives after the deadline for submission of bids, in accordance with ITB 22. Any Bid received by the Employer after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.
24. Withdrawal, Substitution, and Modification of Bids	24.1 A Bidder may withdraw, substitute, or modify its Bid – Technical or Price – after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 20.2 (except for withdrawal notices, which do not require copies). The corresponding substitution or modification of the Bid must accompany the respective written notice. All notices must be <ul style="list-style-type: none"> (a) prepared and submitted in accordance with ITB 20 and ITB 21 (except for withdrawal notices, which do not require copies), and in addition, the respective envelopes shall be clearly marked “WITHDRAWAL,” “SUBSTITUTION,” “MODIFICATION;” and (b) received by the Employer prior to the deadline prescribed for submission of Bids, in accordance with ITB 22.
	24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.
	24.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid or any extension thereof.
25. Bid Opening	25.1 The Employer shall open the Technical Bids in public at the address, on the date, and time specified in the BDS in the presence of Bidders’ designated representatives and anyone who choose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 21.1, shall be as specified in the BDS. The Price Bids will remain unopened and will be held in custody of the Employer until the specified time of their opening. If the Technical Bid and Price Bid are submitted together in one envelope, the Employer may reject the entire Bid. Alternatively, the Price Bid may be immediately resealed for later evaluation.
	25.2 First, envelopes marked “WITHDRAWAL” shall be opened and read out and the envelope with the corresponding Bid shall not be opened.

	<p>but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening.</p>
	<p>25.3 Second, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with ITB 25.1. No envelope shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.</p>
	<p>25.4 Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding modification notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Price Bids, both Original and Modification, will remain unopened in accordance with ITB 25.1.</p>
	<p>25.5 All other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded:</p> <ul style="list-style-type: none"> (a) the name of the Bidder; (b) whether there is a modification or substitution; (c) the presence of a bid security or a Bid-Securing Declaration, if required; and (d) any other details as the Employer may consider appropriate. <p>Only Technical Bids and alternative Technical Bids read out and recorded at bid opening shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Technical Bid are to be initialed by at least three representatives of the Employer attending the bid opening. No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with ITB 23.1.</p>
	<p>25.6 The Employer shall prepare a record of the opening of Technical Bids that shall include, as a minimum, the name of the Bidder and whether there is a withdrawal, substitution, or modification; alternative proposals; and the presence or absence of a bid security or a Bid-Securing Declaration, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.</p>
	<p>25.7 At the end of the evaluation of the Technical Bids, the Employer will invite bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer.</p>

	Bidders shall be given reasonable notice for the opening of Price Bids.
	25.8 The Employer will notify in writing Bidders who have been rejected for submitting nonresponsive Technical Bids and return their Price Bids unopened together with their bid securities, before opening the Price Bids of the substantially responsive Bidders.
	25.9 The Employer shall conduct the opening of Price Bids of all Bidders who submitted substantially responsive Technical Bids, in the presence of Bidders' representatives who choose to attend at the address, on the date, and time specified by the Employer. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance.
	25.10 All envelopes containing Price Bids shall be opened one at a time and the following read out and recorded: (a) the name of the Bidder; (b) whether there is a modification or substitution; (c) the Bid Prices, including any discounts and alternative offers; and (d) any other details as the Employer may consider appropriate. Only Price Bids, discounts, and alternative offers read out and recorded during the opening of Price Bids shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Price Bid and Schedules are to be initialed by at least three representatives of the Employer attending the bid opening. No Bid shall be rejected at the opening of Price Bids.
	25.11 The Employer shall prepare a record of the opening of Price Bids that shall include, as a minimum, the name of the Bidder, the Bid Price (per lot if applicable), any discounts, and alternative offers. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.
E. Evaluation and Comparison of Bids	
26. Confidentiality	26.1 Information relating to the examination, evaluation, comparison, and postqualification of Bids and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until on the publication of Contract award.
	26.2 Any attempt by a Bidder to influence the Employer in the evaluation of the Bids or Contract award decisions may result in the rejection of its Bid.
	26.3 Notwithstanding ITB 26.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it may do so in writing.



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<p>27. Clarification of Bids</p>	<p>27.1 To assist in the examination, evaluation, and comparison of the Technical and Price Bids, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the substance of the Technical Bid or prices in the Price Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Price Bids, in accordance with ITB 33.</p>
	<p>27.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.</p>
<p>28. Deviations, Reservations, and Omissions</p>	<p>28.1 During the evaluation of bids, the following definitions apply:</p> <ul style="list-style-type: none"> (a) "Deviation" is a departure from the requirements specified in the Bidding Document; (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and (c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.
<p>29. Examination of Technical Bids</p>	<p>29.1 The Employer shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB 11.2 have been provided, and to determine the completeness of each document submitted.</p>
	<p>29.2 The Employer shall confirm that the following documents and information have been provided in the Technical Bid. If any of these documents or information is missing, the offer shall be rejected.</p> <ul style="list-style-type: none"> (a) Letter of Technical Bid; (b) written confirmation of authorization to commit the Bidder; (c) Bid Security or Bid-Securing Declaration, if applicable; and (d) Technical Proposal in accordance with ITB 16.
<p>30. Responsiveness of Technical Bid</p>	<p>30.1 The Employer's determination of a Bid's responsiveness is to be based on the contents of the Bid itself, as defined in ITB 11.</p>
	<p>30.2 A substantially responsive Technical Bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,</p> <ul style="list-style-type: none"> (a) if accepted, would: <ul style="list-style-type: none"> (i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or (ii) limit in any substantial way, inconsistent with the Bidding Document, the Employer's rights or the Bidder's obligations under the proposed Contract; or (b) if rectified, would unfairly affect the competitive position of other

	Bidders presenting substantially responsive Bids.
	30.3 The Employer shall examine the technical aspects of the Bid submitted in accordance with ITB 16, Technical Proposal, in particular, to confirm that all requirements of Section 6 (Employer's Requirements) have been met without any material deviation, reservation, or omission.
	30.4 If a Bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.
31. Nonmaterial Nonconformities	31.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid that do not constitute a material deviation, reservation, or omission.
	31.2 Provided that a Technical Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Technical Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the Price Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
	31.3 Provided that a Technical Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made using the method indicated in Section 3 (Evaluation and Qualification Criteria).
32. Qualification of the Bidder	32.1 The Employer shall determine to its satisfaction during the evaluation of Technical Bids whether Bidders meet the qualifying criteria specified in Section 3 (Evaluation and Qualification Criteria).
	32.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 17.1. Unless permitted in the BDS, the determination shall not take into consideration the qualifications of other firms such as the Bidder's subsidiaries, parent entities, or affiliates.
	32.3 An affirmative determination shall be a prerequisite for the opening and evaluation of a Bidder's Price Bid. The Employer reserves the right to reject the bid of any bidder found to be in circumstances described in GCC 73.2(c). A negative determination shall result into the disqualification of the Bid, in which event the Employer shall return the unopened Price Bid to the Bidder.
33. Subcontractors	33.1 Unless otherwise stated in the BDS, the Employer does not intend for the contractor to execute any specific elements of the Works through nominated subcontractors.
	33.2 If Subcontractors are proposed for any of the key activities listed in



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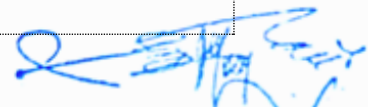
	Section 3 (Evaluation and Qualification) Criteria 2.4.2, they shall be considered as “Specialist Subcontractors” and shall meet qualification requirements for the relevant key activities.
34. Correction of Arithmetical Errors	<p>34.1 During the evaluation of Price Bids, the Employer shall correct arithmetical errors on the following basis:</p> <p>(a) Only for admeasurement contracts, if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected.</p> <p>(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.</p> <p>(c) If there is a discrepancy between the bid price in the Summary of Bill of Quantities and the bid amount in item (c) of the Letter of Price Bid, the bid price in the Summary of Bill of Quantities will prevail and the bid amount in item (c) of the Letter of Price Bid will be corrected.</p> <p>(d) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a), (b) and (c) above.</p>
	34.2 If the Bidder that submitted the lowest evaluated bid does not accept the correction of errors, its Bid shall be disqualified and its bid security may be forfeited or its Bid-Securing Declaration executed.
35. Conversion to Single Currency	35.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as specified in the BDS.
36. Domestic Preference	36.1 Unless otherwise specified in the BDS, domestic preference shall not apply.
37. Evaluation and Comparison of Price Bids	37.1 The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.
	<p>37.2 To evaluate the Price Bid, the Employer shall consider the following:</p> <p>(a) the bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities for admeasurement contracts, or Schedule of Prices for lump sum contracts, but including Daywork items, where priced competitively;</p> <p>(b) price adjustment for correction of arithmetic errors in accordance with ITB 34.1;</p> <p>(c) price adjustment due to discounts offered in accordance with ITB 14.4;</p> <p>(d) converting the amount resulting from applying (a) to (c) above, if</p>

	<p>relevant, to a single currency in accordance with ITB 35;</p> <p>(e) adjustment for nonmaterial nonconformities in accordance with ITB 31.3;</p> <p>(f) assessment whether the bid is abnormally low in accordance with ITB 38; and</p> <p>(g) application of all the evaluation factors indicated in Section 3 (Evaluation and Qualification Criteria).</p>
	<p>37.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.</p>
	<p>37.4 If this Bidding Document allows Bidders to quote separate prices for different contracts, and to award multiple contracts to a single Bidder, the methodology to determine the lowest evaluated price of the contract combinations, including any discounts offered in the Letter of Price Bid, is specified in Section 3 (Evaluation and Qualification Criteria).</p>
	<p>37.5 The Employer shall compare all substantially responsive Bids to determine the lowest evaluated Bid, in accordance with ITB 37.2.</p>
<p>38. Abnormally Low Bids</p>	<p>38.1 An abnormally low bid is one where the bid price, in combination with other elements of the bid, appears to be so low that it raises concerns as to the capability of the Bidder to perform the contract for the offered bid price.</p> <p>38.2 When the offered bid price appears to be abnormally low, the Employer shall undertake a three-step review process as follows:</p> <p>(a) identify abnormally low costs and unit rates by comparing them with the engineer's estimates, other substantially responsive bids, or recently awarded similar contracts;</p> <p>(b) clarify and analyze the bidder's resource inputs and pricing, including overheads, contingencies and profit margins; and</p> <p>(c) decide whether to accept or reject the bid.</p> <p>38.3 With regard to ITB 38.2 (b) above, the Employer will seek a written explanation from the bidder of the reasons for the offered bid price, including a detailed analysis of costs and unit prices, by reference to the scope, proposed methodology, schedule, and allocation of risks and responsibilities. This may also include information regarding the economy of the manufacturing process; the services to be provided, or the construction method to be used; the technical solutions to be adopted; and any exceptionally favorable conditions available to the bidder for the works, equipment or services proposed.</p> <p>38.4 After examining the explanation given and the detailed the price analyses presented by the bidder, the Employer may:</p> <p>(a) accept the bid, if the evidence provided satisfactorily accounts for the low bid price and costs, in which case the bid is not considered abnormally low;</p> <p>(b) accept the bid, but require that the amount of the performance security be increased at the expense of the bidder to a level</p>

Handwritten signature in blue ink. Below it is a blue official stamp that reads: "Provincial Road Improvement Project (PIU) C&W Department Peshawar".

	<p>sufficient to protect the Employer against financial loss. The amount of the performance security shall generally be not more than 20% of the contract price; or</p> <p>(c) reject the bid if the evidence provided does not satisfactorily account for the low bid price, and make a similar determination for the next ranked bid, if required.</p>
39. Unbalanced or Front-Loaded Bids	<p>39.1 If the Bid, which results in the lowest evaluated Bid Price, is seriously unbalanced or front-loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed, as well as the pricing and sources of materials, equipment and labor.</p> <p>39.2 After the evaluation of the information and detailed price analyses presented by the Bidder, the Employer may as appropriate:</p> <p>(a) accept the Bid; or</p> <p>(b) accept the Bid, but require that the total amount of the Performance Security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract subject to ITB 45.2; or</p> <p>(c) reject the Bid and make a similar determination for the next ranked bid.</p>
40. Employer's Right to Accept Any Bid, and to Reject Any or All Bids	<p>40.1 The Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all Bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all Bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.</p>
41. Notice of Intention for Award of Contract	<p>41.1 If Standstill provisions apply as specified in the BDS, the standstill period shall be defined in the BDS to specify the duration subsequent to notification of intention for award of contract (before making the actual contract award) within which any unsuccessful bidder can challenge the proposed award.</p>
F. Award of Contract	
42. Award Criteria	<p>42.1 The Employer shall award the Contract to the Bidder whose offer has been determined in line with ITB 35 to ITB 37 above to be the lowest evaluated Bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.</p>
43. Notification of Award	<p>43.1 Prior to the expiration of the period of bid validity and upon expiry of the standstill period specified in ITB 40.1, or upon satisfactory resolution of a complaint filed within standstill period, if applicable, the Employer shall transmit the Notification of Award through issuance of Letter of Acceptance using the form included in Section 9 (Contract Forms) to the successful Bidder, in writing, that its Bid has been accepted. At the same time, the Employer shall also notify all other</p>

	<p>Bidders of the results of the bidding.</p> <p>43.2 Unless standstill period applies, upon notification of award through issuance of Letter of Acceptance, unsuccessful Bidders may request in writing to the Employer for a debriefing seeking explanations on the grounds on which their Bids were not selected. The Employer shall promptly respond in writing and/or in a debriefing meeting to any unsuccessful Bidder who, after publication of contract award, requests a debriefing.</p> <p>43.3 Until a formal contract is prepared and executed, the notification of award through issuance of Letter of Acceptance shall constitute a binding Contract.</p>
	<p>43.4 Within 2 weeks of the award of contract or expiry of the standstill period, where such period applies, or, if a complaint has been filed within the standstill period, upon receipt of ADB's confirmation of satisfactory resolution of the complaint, the borrower shall publish in an English language newspaper or widely known and freely accessible website the results identifying the bid and lot or package numbers, as applicable and the following information:</p> <ul style="list-style-type: none"> (a) name of each Bidder who submitted a Bid; (b) bid prices as read out at bid opening; (c) name and evaluated prices of each Bid that was evaluated; (d) name of Bidders whose bids were rejected and the reasons for their rejection; and (e) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded.
<p>44. Signing of Contract</p>	<p>44.1 Promptly after notification, the Employer shall send the successful Bidder the Contract Agreement.</p>
	<p>44.2 Within 28 days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.</p>
<p>45. Performance Security</p>	<p>45.1 Within 28 days of the receipt of notification of award through issuance of Letter of Acceptance from the Employer, the successful Bidder shall furnish the performance security in accordance with the Conditions of Contract, subject to ITB 38 and ITB 39, using for that purpose the Performance Security Form included in Section 9 (Contract Forms), or another form acceptable to the Employer. If the bank issuing performance security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.</p>
	<p>45.2 Failure of the successful Bidder to submit the abovementioned performance security or to sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security or execution of the Bid-Securing Declaration. In that event, the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.</p>



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	45.3 The above provision shall also apply to the furnishing of a domestic preference security, if so required.
46. Bidding-Related Complaints	46.1 The procedures for dealing with Bidding-Related Complaints arising out of this bidding process are specified in the BDS.

Section 2: Bid Data Sheet

A. General

ITB 1.1	The number of the Invitation for Bids (IFB) is: KPRRDP/OCB/CW-07
ITB 1.1	The Employer is: Communication & Works Department (C&WD), Government of Khyber Pakhtunkhwa, Peshawar
ITB 1.1	<p>The name of the bidding process is: Package-7: Rehabilitation and Improvement of Flood Affected and Tourism Roads in District Chitral [02-Lots]</p> <p>The identification number of the bidding process is: KPRRDP/OCB/CW-07</p> <p>The number and identification of lots comprising this bidding process is: Two (02)</p> <ul style="list-style-type: none"> ➤ Lot-1: Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral ➤ Lot-2: Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral <p>The bidder has the option to bid any number of lots.</p>
ITB 2.1	The Borrower is: Islamic Republic of Pakistan
ITB 2.1	The name of the Project is: Khyber Pakhtunkhwa Rural Roads Development Project

B. Contents of Bidding Documents

ITB 7.1	<p>For clarification purposes only, the Employer's address is:</p> <table border="1" style="width: 100%;"> <tr> <td>Attention:</td> <td>Project Director</td> </tr> <tr> <td>Street address:</td> <td>Project Implementation Unit (PIU) ADB Assisted Projects Communication and Works Department (C&WD) House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa, Pakistan</td> </tr> <tr> <td>Floor / Room number:</td> <td>Committee Room, Ground Floor, Office of the Project Director, PIU, KP PRIP-C&WD</td> </tr> <tr> <td>City:</td> <td>Peshawar</td> </tr> <tr> <td>ZIP code:</td> <td>25000</td> </tr> <tr> <td>Country:</td> <td>Islamic Republic of Pakistan</td> </tr> <tr> <td>Telephone:</td> <td>+92 91 9216356</td> </tr> <tr> <td>Fax:</td> <td>+92 91 9212443</td> </tr> <tr> <td>E-mail address:</td> <td>pdprpp.pkha@gmail.com</td> </tr> </table> <p>Requests for clarification should be received by the Employer no later than: fifteen (15) days</p>	Attention:	Project Director	Street address:	Project Implementation Unit (PIU) ADB Assisted Projects Communication and Works Department (C&WD) House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa, Pakistan	Floor / Room number:	Committee Room, Ground Floor, Office of the Project Director, PIU, KP PRIP-C&WD	City:	Peshawar	ZIP code:	25000	Country:	Islamic Republic of Pakistan	Telephone:	+92 91 9216356	Fax:	+92 91 9212443	E-mail address:	pdprpp.pkha@gmail.com
Attention:	Project Director																		
Street address:	Project Implementation Unit (PIU) ADB Assisted Projects Communication and Works Department (C&WD) House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa, Pakistan																		
Floor / Room number:	Committee Room, Ground Floor, Office of the Project Director, PIU, KP PRIP-C&WD																		
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Country:	Islamic Republic of Pakistan																		
Telephone:	+92 91 9216356																		
Fax:	+92 91 9212443																		
E-mail address:	pdprpp.pkha@gmail.com																		
ITB 7.4	A Pre-Bid meeting shall take place.																		

Date:	06 March 2025
Time:	1100 Hours (Local time, i.e., Pakistan Standard Time)
Place:	Office of the Project Director PIU, KP PRIP-C&WD House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa Pakistan
City:	Peshawar
Country:	Islamic Republic of Pakistan

A site visit conducted by the Employer **will not be** organized.

C. Preparation of Bids

ITB 10.1	<p>The language of the Bid is: English.</p> <p>The translation of the documents shall be duly notarized.</p>
ITB 11.2 (g)	<p>The Bidder shall submit with its Technical Bid the following additional documents:</p> <ol style="list-style-type: none"> Quality Control Methods for Asphalt & Concrete Work. Construction Schedule (on Primavera /MS project or equivalent) by allocating the equipment and other resources; critical activities must be identified. Diversion of Traffic and Safety Management Plan. Health and Safety Management Plan. Environmental Safety Plan. Letter of Acceptance / Award, completion certificates, IPCs / BOQs to substantiate construction experience. Documents indicating availability of financial resources shown by the bidder to meet the requirement of Serial No. 2.3.1, Section-3 (i.e., audited standalone (not consolidated) financial statements, line of credit which shall (i) be address to the Client; (ii) be issued within last 02 month; (iv) be unconditional; and (v) be valid and available (specifying the remaining balance of the credit) to the bidder for the complete Time for Completion of the Project). Supporting documents to substantiate construction experience (refer 2.4.1; and 2.4.2 of Section 3) such as (a) Letter of Acceptance, (b) Letter of Award, (c) Letter of completion/ certificates, substantial completion certificates, taking over certificates, performance certificates etc. (d) IPCs; and. (e) BOQs, Bidders are required to submit all documents to support their bid in English language. <p>Bidders are required to submit all documents to support their bid in English language. If the documentary evidence is in a language other than the English language, then the bidder shall submit accurate translation of the relevant passages in the English language duly attested by the notary public of the Bidder's Country or similar legal instrument of notarization as applicable under the laws of the Bidder's home country, (specifying the authority for such attestation as per law of the country).</p> <p>If a Bidder omits to submit any of the above documents or the documents submitted are deficient, the Bid shall not be rejected in the first instance and a clarification will be sought from the Bidder under ITB 27.</p>
ITB 11.3 (b)	<p>ITB 11.3(b) In accordance with ITB 12 and ITB 14, the priced Bill of Quantities shall be submitted with the bid.</p>

ITB 11.3 (d)	<p>The Bidder shall submit with its Price Bid the following additional documents:</p> <ul style="list-style-type: none"> • Any other documents mentioned in Section-4 Page 4-34, 4-35, 4-36 and 4-37 "Schedule of payment currency". • Unit price analysis for major items of works.
ITB 11.4	<p>The Joint Venture Agreement or a Letter of Intent to execute a Joint Venture Agreement in the event of the successful Bid, shall include the following:</p> <ul style="list-style-type: none"> (i) All partners shall be jointly and severally liable. (ii) The lead partner shall be clearly identified, nominated and designated as the Representative of the Joint Venture. (iii) The financial share of each partner shall be clearly stated. (iv) Corresponding to the financial share of each Partner, the roles and responsibilities of each partner, including the separate scope or part of the Works (if any) to be carried out by each partner, shall also be specified; and (v) Any other requirements as per the applicable law. <p>In case a Letter of Intent to execute a Joint Venture Agreement is submitted by the successful Bidder at the time of submission of the Bid, the Bidder shall be bound to submit a duly executed Joint Venture Agreement to the Employer immediately after the issuance of Letter of Acceptance but not later than 28 days after the issuance of the same. Such Joint Venture Agreement, thus submitted by the successful Bidder must contain the information postulated above. Failure to comply with this condition may lead to the annulment of the award and forfeiture of the Bid Security. In that event, the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.</p>
ITB 12.1	<p>The units and rates in figures entered into the Bill of Quantities and Daywork Schedule should be typewritten or if written by hand, must be in print form. Bill of Quantities and Daywork Schedule not presented accordingly may be considered nonresponsive.</p>
ITB 13.1	<p>Alternative Bids shall not be permitted.</p>
ITB 13.2	<p>Alternative times for completion shall not be permitted.</p>
ITB 13.4	<p>Alternative technical solutions shall be permitted for the following parts of the Works: Not Applicable</p>
ITB 14.5	<p>The prices quoted by the Bidder Adjustable subject to adjustment during the performance of the Contract.</p> <p>The formula for adjusting the prices and explanatory details is specified in the GCC Clause 54.1. Bidder shall fill out the Tables of Adjustment Data in Section 4 (Bidding Forms).</p>
ITB 15.1	<p>The prices shall be quoted by the bidder in: "Pakistan Rupees".</p> <p>a) The prices shall be quoted by the Bidder in: Pakistan Rupees (PKR). A Bidder expecting to incur expenditures in other currencies for inputs to the</p>

	<p>Works supplied from outside the Employer’s country (referred to as the “foreign currency requirements”) and wishing to be paid accordingly, may indicate other foreign currencies of their choice expressed as a percentage of the bid price, together with the exchange rates used in the calculations in the Schedule of Payment Currencies included in Section 4 (Bidding Forms).</p> <p>b) The rates of exchange to be used by the Bidder for currency conversion during bid preparation shall be the selling rates for similar transactions prevailing on the date 28 days prior to the deadline for submission of Bids published by State Bank of Pakistan. If exchange rates are not so published for certain currencies, the Bidder shall state the rates used and the source. Bidders should note that for the purpose of payments, the exchange rates confirmed by the Project Manager or rates notified by the State Bank of Pakistan as the selling rates prevailing 28 days prior to the deadline for submission of bids shall apply for the duration of the Contract so that no currency exchange risk is borne by the Bidder.</p> <p>c) Foreign currency requirements indicated by the Bidders in the Schedule of Payment Currencies shall include but not limited to the specific requirements for:</p> <ul style="list-style-type: none"> • expatriate staff and labor employed directly on the Works. • social, insurance, medical, and other charges relating to such expatriate staff and labor, and foreign travel expenses. • imported materials, both temporary and permanent, including fuels, oil and lubricants required for the Works. • depreciation and usage of imported Plant and Contractor’s Equipment, including spare parts, required for the Works. • foreign insurance and freight charges for imported materials, Plant and Contractor’s Equipment, including spare parts; and • overhead expenses, fees, profit, and financial charges arising outside the Employer’s country in connection with the Works. <p>d) Bidders may be required by the Employer to clarify their foreign currency requirements, and to substantiate that the amounts included in the unit rates and prices and shown in the Schedule of Payment Currencies are reasonable and responsive to item (c) above, in which case a detailed breakdown of its foreign currency requirements shall be provided by the Bidder.</p> <p>Bidders should note that during the progress of the Works, the foreign currency requirements of the outstanding balance of the Contract Price may be adjusted by agreement between the Employer and the Contractor in order to reflect any changes in foreign currency requirements for the Contract, in accordance with Subclause 54.1 of the Conditions of Contract. Any such adjustment shall be affected by comparing the percentages quoted in the bid with the amounts already used in the Works and the Contractor’s future needs for imported items.</p>
<p>ITB 16.1</p>	<p>The technical Proposal shall also include a Health and Safety COVID-19 Management Plan, in accordance with Standard Operating Procedures (SOPs) issued by the Government of Pakistan from time to time on COVID-19 prevention and controls, and with international good practice guidelines [<i>World Health Organization, Considerations for public health and social measures in the workplace in the context of COVID-19. Geneva. Available here: https://www.who.int/publications-detail/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19]. Absence of or incomplete submission may result in rejection of the bid. If a Bidder submits a Health and Safety COVID-19 Plan that does not provide sufficient information in accordance with the required submission information listed in the bidding document by the Employer, the Employer shall issue a clarification to request for further information from the Bidder. The Bidder must submit the requested</i></p>

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	<p>information within seven (07) working days of receiving such a request. Failure to provide a satisfactory response to the request for further information within the prescribed period of receiving such a request shall cause the rejection of the Bid.</p> <p>Also refer to ADB SDCC's advisory in relation to Health and Safety COVID-19 and international good practices.</p>
ITB 18.1	<p>The bid validity period shall be one hundred and twenty (120) days.</p> <p>Note: This is applicable for each lot separately.</p>
ITB 19.1	<p>The Bidder shall furnish a Bid-Securing Declaration.</p>
ITB 19.2	<p>The ineligibility period is: Five (05) Years</p>
ITB 19.4	<p>Subject to the succeeding sentences, any bid not accompanied by Bid-Securing Declaration shall be rejected by the Employer as nonresponsive. If a Bidder submits a Bid-Securing Declaration that (i) deviates in form, content, and/or period of validity or (ii) does not provide sufficient identification of the Bidder (including, without limitation, failure to indicate the name of the Joint Venture or, where the Joint Venture has not yet been constituted, the names of all future Joint Venture Partners), the Employer shall request the Bidder to submit a compliant Bid-Securing Declaration within seven (07) days of receiving such a request. Failure to provide a compliant Bid-Securing Declaration within the prescribed period of receiving such a request shall cause the rejection of the Bid.</p>
ITB 20.1	<p>In addition to the original Bid, the number of copies is: Three (03)</p> <p>To facilitate evaluation, bidders are encouraged to submit the scanned soft copies, in PDF format, of their Bids in shape of a USB Drive.</p> <p>The soft copy (USB) of the Bids shall be enclosed in the envelope containing the hard copy of the Bidder's Original Bid.</p> <p>If there is any discrepancy between the data/information in the soft copy (USB) of the Bidder's Bids and the hard copy of the Bidder's Bids and between the Price indicated in the hard copy of the Bidder's Original Price Bid, and in the soft copy (USB) of the Bidder's Price Bid, the data and information indicated in the hard copy of the Original Bid shall prevail. All of the rates and amounts must be written by the bidder in words that are written in figures.</p> <p>In addition to above, soft copy of Priced Bid in "Excel format", in the same USB containing the "PDF format", shall also be provided in the envelope containing the hard copy of the Bidder's Original Price Bid, to facilitate review and evaluation process.</p> <p>Any information that indicates or alludes to the price of the bid MUST NOT be provided in the envelop or USB containing the technical bid. Failure to meet this requirement shall be considered as a sufficient ground for rejection of bids.</p> <p>Note: Submission of the USB is only for reference and shall not constitute electronic bid submission as stipulated in ITB 21.1(b) and is provision in the Data Sheet.</p>
ITB 20.2	<p>The written confirmation of authorization to sign on behalf of the Bidder shall consist of <i>a board resolution or its equivalent, or power of attorney, which should either be:</i></p> <p><i>a) notarized, or</i></p>

	<p>b) <i>attested to by an appropriate forum (authority) in the Bidder's home country, specifying the representative's authority to sign the bid on behalf of the bidder.</i></p> <p><i>If the bidder is an intended or existing joint venture, such authorization should be signed by all parties and specify the representative's authority to sign the bid on behalf of the intended or existing joint venture.</i></p> <p><i>If the joint venture has not yet been formed, also include written evidence from all proposed partners of joint venture of their intent to enter into a joint venture in the event of a contract award.</i></p>
ITB 20.2	The Bidder shall submit an acceptable authorization within seven (07) days .

D. Submission and Opening of Bids

ITB 21.1	Bidders shall submit their Bids by mail or by hand.																
ITB 21.1 (b)	Electronic bidding submission procedures shall be: Not Applicable																
ITB 22.1	<p>For bid submission purposes only, the Employer's address is:</p> <table border="1"> <tr> <td>Attention:</td> <td>Project Director</td> </tr> <tr> <td>Street address:</td> <td>House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa, Pakistan</td> </tr> <tr> <td>Floor / Room number:</td> <td>Committee Room, Ground Floor, Office of the Project Director, PIU, ADB Assisted Projects, C&WD, GoKP</td> </tr> <tr> <td>City:</td> <td>Peshawar</td> </tr> <tr> <td>ZIP code:</td> <td>25000</td> </tr> <tr> <td>Country:</td> <td>Islamic Republic of Pakistan</td> </tr> </table> <p>The deadline for bid submission is:</p> <table border="1"> <tr> <td>Date:</td> <td>24 March 2025</td> </tr> <tr> <td>Time:</td> <td>1100 Hours (Local time i.e., Pakistan Standard Time)</td> </tr> </table>	Attention:	Project Director	Street address:	House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa, Pakistan	Floor / Room number:	Committee Room, Ground Floor, Office of the Project Director, PIU, ADB Assisted Projects, C&WD, GoKP	City:	Peshawar	ZIP code:	25000	Country:	Islamic Republic of Pakistan	Date:	24 March 2025	Time:	1100 Hours (Local time i.e., Pakistan Standard Time)
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Date:	24 March 2025																
Time:	1100 Hours (Local time i.e., Pakistan Standard Time)																
ITB 25.1	<p>The opening of the Technical Bid shall take place at:</p> <table border="1"> <tr> <td>Place:</td> <td>Office of the Project Director</td> </tr> <tr> <td>Street address:</td> <td>House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa, Pakistan</td> </tr> <tr> <td>Floor / Room number:</td> <td>Committee Room, Ground Floor, Office of the Project Director, PIU, ADB Assisted Projects, C&WD, GoKP</td> </tr> <tr> <td>City:</td> <td>Peshawar</td> </tr> <tr> <td>ZIP code:</td> <td>25000</td> </tr> <tr> <td>Country:</td> <td>Islamic Republic of Pakistan</td> </tr> <tr> <td>Date:</td> <td>24 March 2025</td> </tr> <tr> <td>Time:</td> <td>1105 Hours (Local time i.e., Pakistan Standard Time)</td> </tr> </table>	Place:	Office of the Project Director	Street address:	House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa, Pakistan	Floor / Room number:	Committee Room, Ground Floor, Office of the Project Director, PIU, ADB Assisted Projects, C&WD, GoKP	City:	Peshawar	ZIP code:	25000	Country:	Islamic Republic of Pakistan	Date:	24 March 2025	Time:	1105 Hours (Local time i.e., Pakistan Standard Time)
Place:	Office of the Project Director																
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City:	Peshawar																
ZIP code:	25000																
Country:	Islamic Republic of Pakistan																
Date:	24 March 2025																
Time:	1105 Hours (Local time i.e., Pakistan Standard Time)																
ITB 25.1	Electronic bid opening procedure shall be as follows: Not Applicable																
ITB 25.5	The Letter of Technical Bid shall be initialed by at least three (03) representatives of the Employer attending the Bid opening.																
ITB 25.10	The Letter of Price Bid and Schedules shall be initialed by at least three (03) representatives of the Employer attending the Bid opening.																

E. Evaluation and Comparison of Bids



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ITB 32.2	The qualifications of other firms such as the Bidder's subsidiaries, parent entities, or affiliates shall not be permitted.
ITB 33.1	The Employer does not intend for the contractor to execute any specific elements of the Works through nominated subcontractors.
ITB 35.1	The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is: Pak Rupees (PKR) The source of the selling exchange rate shall be: State Bank of Pakistan The date for the selling exchange rate shall be: 28 days prior to the deadline for submission of bids.
ITB 36.1	Domestic preference shall not apply.
ITB 41.1	Standstill provisions shall not apply.

F. Award of Contracts

ITB 46.1	<p>The procedures for Bidding-Related Complaints are referenced in the Procurement Regulations for ADB Borrowers (Appendix 7). The Bidder should submit its complaint following these procedures, in writing, to:</p> <table border="1" style="margin-left: 40px;"> <tr> <td>For the attention:</td> <td><i>Engr. Naveed Iqbal</i></td> </tr> <tr> <td>Title/position:</td> <td><i>Chief Engineer, Foreign Aided Projects</i></td> </tr> <tr> <td>Employer:</td> <td><i>Communication and Works (C&W) Department</i></td> </tr> <tr> <td>Email address:</td> <td><i>chiefengineer.fap@gmail.com</i></td> </tr> </table>	For the attention:	<i>Engr. Naveed Iqbal</i>	Title/position:	<i>Chief Engineer, Foreign Aided Projects</i>	Employer:	<i>Communication and Works (C&W) Department</i>	Email address:	<i>chiefengineer.fap@gmail.com</i>
For the attention:	<i>Engr. Naveed Iqbal</i>								
Title/position:	<i>Chief Engineer, Foreign Aided Projects</i>								
Employer:	<i>Communication and Works (C&W) Department</i>								
Email address:	<i>chiefengineer.fap@gmail.com</i>								

Section 3: Evaluation and Qualification Criteria

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1. Evaluation

In addition to the criteria listed in ITB 37.2 (a)–(f), other relevant factors are as follows:

1.1 Adequacy of Technical Proposal

Evaluation of the Bidder's Technical Proposal will include an assessment of the Bidder's technical capacity to successfully implement the contract considering its proposed site organization, method statement, mobilization, and construction schedule (to be described by the Bidder in sufficient detail to demonstrate the adequacy of its work methods, scheduling, and material sourcing) including the extent to which they are presented in a consistent manner and comply with requirements stipulated in Section 6 (Employer's Requirements) without material deviation, reservation, or omission.

Noncompliance with equipment and personnel requirements described in Section 6 (Employer's Requirements) shall not normally be a ground for bid rejection, and such noncompliance will be subject to clarification during bid evaluation and rectification prior to contract award.

1.2 Completion Time

An alternative Completion Time, if permitted under ITB 13.2, will be evaluated as follows:

Not Applicable

1.3 Technical Alternatives

Technical alternatives, if permitted under ITB 13.4, will be evaluated as follows:

Not Applicable

1.4 Specialist Subcontractors

Only the specific experience of Specialist Subcontractors for key activities specified in criterion 2.4.2 Construction Experience in Key Activities will be considered. The experience of Specialist Subcontractors in contracts of similar size and nature, and their financial resources shall not be added to those of the Bidder for purposes of qualification of the Bidder.

Not Applicable

1.5 Quantifiable Nonconformities and Omissions

Subject to ITB 14.2 and ITB 37.2, the evaluated cost of quantifiable nonconformities including omissions, is determined as follows:

Pursuant to ITB 31.3, the cost of all quantifiable nonmaterial nonconformities shall be evaluated, including omissions in Daywork where competitively priced but excluding omission of prices in the Bill of Quantities. The Employer will make its own assessment of the cost of any nonmaterial nonconformities and omissions for the purpose of ensuring fair comparison of bids.

1.6 Domestic Preference

If domestic preference shall apply under ITB 36.1, the procedure will be as follows as:

Not Applicable

1.7 Other Criteria

The Employer will take into account the quality of the Health and Safety COVID-19 Management Plan ('the Plan') attached to the Technical Proposal in its evaluation of the Adequacy of the Technical Proposal.

The bidder should demonstrate in the Plan the health and safety measures they will put in place on site in relation to COVID-19 prevention and controls, including but not limited to, Personal Protective Equipment (PPE) requirements, site set up, training, induction and mobilization of new personnel, equipment and plants cleaning and other hazard management measures while undertaking site work activities, site visitors health and safety protocols, as well as the approach to the monitoring and reporting of the Plan. The Plan should be fit for purpose for the particular construction works of this contract and be aligned with Standard Operating Procedures (SOPs) issued by the Government of Pakistan from time to time on COVID-19 prevention and controls, as well as workplace safety requirements, with international good practice guidelines [World Health Organization, Considerations for public health and social measures in the workplace in the context of COVID-19. Geneva. Available here: <https://www.who.int/publications-detail/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19>]. Also refer to ADB SDCC's advisory in relation to COVID-19 health and safety and international good practices

1.7.1 Environmental, Health and Safety Management Plan (EHSMP)

Any bid not accompanied by the EHSMP may be rejected by the Employer as nonresponsive. If a Bidder submits a EHSMP that is not commensurate with the risks and impacts of the proposed works and activities in the bidding document, the Employer shall issue a request for clarification to request for further information from the Bidder. The Bidder must submit the requested information within **five (05)** days of receiving such a request. Failure to provide a satisfactory response to the request for further information within the prescribed period of receiving such a request may cause the rejection of the Bid.

1.7.2 Sustainable Procurement

The following sustainable procurement technical requirements will be evaluated on a pass/fail basis. Failure to meet any of the following requirements will result in mandatory rejection of the bid.

Not Applicable.

1.7.3 Life Cycle costs (for Financial Evaluation)

Life cycle costing **shall not** apply.



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1.8 Multiple Contracts

If works are grouped in multiple contracts and pursuant to ITB 37.4, the Employer shall evaluate and compare Bids on the basis of a contract, or a combination of contracts, or as a total of contracts in order to arrive at the least-cost combination for the Employer by taking into account discounts offered by Bidders in case of award of multiple contracts.

If a Bidder as defined in ITB 4.1 submits several successful (lowest evaluated substantially responsive) bids, the evaluation will also include an assessment of the Bidder's capacity to meet the following aggregated requirements as presented in the bid:

- Average annual construction turnover,
- Financial resources,
- Equipment to be allocated, and
- Personnel to be fielded.

2. Qualification

2.1 Eligibility

Criteria	Compliance Requirements			Documents
Requirement	Single Entity	Joint Venture		Submission Requirements
		All Partners Combined	Each Partner	

2.1.1 Nationality

Nationality in accordance with ITB 4.2.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Forms ELI - 1; ELI - 2 with attachments
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2.1.2 Conflict of Interest

No conflicts of interest in accordance with ITB 4.3.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid
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2.1.3 ADB Eligibility

Not having been declared ineligible by ADB, as described in ITB 4.4.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid
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2.1.4 Government-Owned Enterprise

Bidder required to meet conditions of ITB 4.5.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Forms ELI - 1, ELI - 2 with attachments
--	-----------------------	-----------------------	-----------------------	----------------	---

2.1.5 United Nations Eligibility

Not having been excluded by an act of compliance with a United Nations Security Council resolution in accordance with ITB 4.8.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid
--	-----------------------	-----------------------	-----------------------	----------------	-------------------------

2.1.6 Registration with Pakistan Engineering Council (PEC)

The successful Bidder must be registered with Pakistan Engineering Council (PEC) and shall have a valid registration Certificate in following category with Specialization in CE-01 & CE-02 before signing the Contract.	must meet requirement	not applicable	must meet requirement	Not applicable	Forms ELI - 1; ELI - 2 with attachments
---	-----------------------	----------------	-----------------------	----------------	---

<p>Lot-1: Lot-2:</p>	<p>Category C-A Category C-A</p>					
<p>If the successful bidder is a JV including a local firm whose registration is expired at the time of Bid submission, the firm shall be required to submit a valid PEC registration certificate before signing the Contract. If the successful bidder is a single entity or JV comprises a foreign firm, the foreign firm shall be required to submit a valid PEC registration certificate before signing of the Contract.</p>						

2.2 Historical Contract NonPerformance

2.2.1 History of NonPerforming Contracts

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Non-performance of a contract ¹ did not occur as a result of contractor default since 1 January 2017 .	Must meet requirement	Must meet requirement	Must meet requirement ²	Not Applicable	Form CON-1

2.2.2 Suspension Based on Execution of Bid-Securing Declaration

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Not under suspension based on execution of a Bid-Securing Declaration pursuant to ITB 4.6.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid

¹ Nonperformance, as decided by the Employer, shall include all contracts where (a) nonperformance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Nonperformance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism. Nonperformance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.

² This requirement also applies to contracts executed by the Bidder as Joint Venture partner.



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2.2.3 Pending Litigation and Arbitration

Pending litigation and arbitration criterion **shall** apply.

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
All pending litigation, arbitration, or other material events impacting the net worth and/or liquidity of the bidder, if any, shall be treated as resolved against the Bidder and so shall in total not represent more than fifty percent (50%) of the Bidder's net worth calculated as the difference between total assets and total liabilities.	Must meet requirement	Not applicable	Must meet requirement	Not applicable	Form CON - 1

2.2.4 Declaration: Environmental, Health and Safety Past Performance

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Declare any contracts that have been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, health and safety contractual obligations in the past five (05) years .	Must make the declaration. If the bidder proposes Specialist Sub-contractor/s to meet EQC 2.4.2, those Specialist Sub-contractor/s must also make the declaration	Not applicable	Each partner must make the declaration. If the bidder proposes Specialist Sub-contractor/s to meet EQC 2.4.2, those Specialist Sub-contractor/s must also make the declaration	Not applicable	Form CON-2

2.3 Financial Situation

2.3.1 Historical Financial Performance

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Submission of audited financial statements or, if not required by the law of the Bidder's country, other financial statements acceptable to the Employer, for the last three (03) years to demonstrate the current soundness of the Bidder's financial position. As a minimum, the Bidder's net worth for the last year, calculated as the difference between total assets and total liabilities should be positive.	Must meet requirement	Not applicable	Must meet requirement	Not applicable	Form FIN - 1 with attachments

2.3.2 Average Annual Construction Turnover

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Minimum average annual construction turnover calculated as total certified payments received for contracts in progress or completed, within the last three (03) years.	Must meet requirement	Must meet requirement	Must meet 25% of the requirement	Must meet 40% of the requirement	Form FIN - 2
for Lot-1 PKR 4,714.0 million or US\$ equivalent					
for Lot-2 PKR 4,943.0 million or US\$ equivalent					



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2.3.3 Financial Resources

If the bid evaluation process and the decision for the award of the Contract takes more than 1 year from the date of bid submission, Bidders may be asked to resubmit their current contract commitments and latest information on financial resources supported by latest audited accounts or audited financial statements, or if not required by the law of the Bidder's country, other financial statements acceptable to the Employer, and the Bidders' financial capacity, will be reassessed on this basis.

Criteria Requirement	Single Entity	Compliance Requirements			Documents Submission Requirements				
		Joint Venture							
		All Partners Combined	Each Partner	One Partner					
<p>For Single Entities</p> <p>The Bidder must demonstrate that its financial resources defined in FIN-3, less its financial obligations for its current contract commitments defined in FIN-4, meet or exceed the total requirement for the following lots:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 2px;">for Lot-1</td> <td style="padding: 2px;">PKR 786.0 million or US\$ equivalent</td> </tr> <tr> <td style="padding: 2px;">for Lot-2</td> <td style="padding: 2px;">PKR 824.0 million or US\$ equivalent</td> </tr> </table>	for Lot-1	PKR 786.0 million or US\$ equivalent	for Lot-2	PKR 824.0 million or US\$ equivalent	must meet requirement	not applicable	not applicable	not applicable	<p>Form FIN – 3 and Form FIN – 4</p> <p>If the Bidder intends to utilize a line of credit to fulfill the financial resources requirement, the Bidder must obtain a letter of line of credit from a recognized bank. The letter must be: (i) addressed to the Client; (ii) shall be issued within last 02 month; (iii) it should be unconditional; and (iv) credit line must be valid and available (specifying remaining balance of credit) to the bidder for the complete Time for Completion of the Project).</p> <p>Separate / specific letters should be submitted for respective lot, in case a bidder is submitting bids for multiple lots.</p>
for Lot-1	PKR 786.0 million or US\$ equivalent								
for Lot-2	PKR 824.0 million or US\$ equivalent								
<p>For Joint Ventures</p> <p>(1) One partner must demonstrate that its financial resources defined in FIN-3, less its financial obligations for its own current contract commitments defined in FIN-4, meet or exceed its required share from the total requirement for the following lots.</p>	not applicable	not applicable	not applicable	must meet requirement	<p>Form FIN – 3 and Form FIN – 4</p> <p>If the Bidder intends to utilize a line of credit to fulfill the financial resources requirement, the Bidder must obtain a letter of line of credit from a recognized</p>				

Criteria		Compliance Requirements			Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
<p>for Lot-1 PKR 314.40 million or US\$ equivalent</p> <p>for Lot-2 PKR 330.0 million or US\$ equivalent</p> <p>AND</p>					<p>bank. The letter must be: (i) addressed to the Client; (ii) shall be issued within last 02 month; (iii) it should be unconditional; and (iv) credit line must be valid and available (specifying remaining balance of credit) to the bidder for the complete Time for Completion of the Project).</p> <p>Separate / specific letters should be submitted for respective lot, in case a bidder is submitting bids for multiple lots.</p>
<p>(2) Each partner must demonstrate that its financial resources defined in FIN - 3, less its financial obligations for its own current contract commitments defined in FIN - 4, meet or exceed its required from the total requirement for the following lots.</p> <p>for Lot-1 PKR 197.0 million or US\$ equivalent</p> <p>for Lot-2 PKR 206.0 million or US\$ equivalent</p> <p>AND</p>	not applicable	not applicable	must meet requirement	not applicable	<p>Form FIN – 3 and Form FIN – 4</p> <p>If the Bidder intends to utilize a line of credit to fulfill the financial resources requirement, the Bidder must obtain a letter of line of credit from a recognized bank. The letter must be: (i) addressed to the Client; (ii) shall be issued within last 02 month; (iii) it should be unconditional; and (iv) credit line must be valid and available (specifying remaining balance of credit) to the bidder for the complete Time for Completion of the Project).</p> <p>Separate / specific letters should be submitted for respective lot, in case a bidder is submitting bids for</p>

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
<p>(3) The Joint Venture must demonstrate that the combined financial resources of all partners defined in FIN-3, less all the partners' total financial obligations for the current contract commitments defined in FIN-4, meet or exceed the total requirement for the following lots:</p> <p>for Lot-1 PKR 786.0 million or US\$ equivalent</p> <p>for Lot-2 PKR 824.0 million or US\$ equivalent</p>	not applicable	must meet requirement	not applicable	not applicable	<p>multiple lots.</p> <p>Form FIN – 3 and Form FIN – 4</p> <p>If the Bidder intends to utilize a line of credit to fulfill the financial resources requirement, the Bidder must obtain a letter of line of credit from a recognized bank. The letter must be: (i) addressed to the Client; (ii) shall be issued within last 02 month; (iii) it should be unconditional; and (iv) credit line must be valid and available (specifying remaining balance of credit) to the bidder for the complete Time for Completion of the Project).</p> <p>Separate / specific letters should be submitted for respective lot, in case a bidder is submitting bids for multiple lots.</p>


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2.4 Construction Experience

2.4.1 Contracts of Similar Size and Nature

Criteria Requirement	Compliance Requirements				Documents Submission Requirements			
	Single Entity	Joint Venture						
		All Partners Combined	Each Partner	One Partner				
Participation as a contractor, Joint Venture partner, or Subcontractor, in at least one contract that has been satisfactorily and substantially completed within the last five (05) years and that is similar to the proposed works, where the value of the Bidder's participation exceeds amounts mentioned below. The similarity of the Bidder's participation shall be based on: <ol style="list-style-type: none"> 1. the physical size 2. nature of works 3. complexity, methods 4. technology or 5. other characteristics as described in Section 6, Employer's Requirements	Must meet requirement	Not Applicable	Must meet the requirement equivalent to 30% of value of the contract of similar size and nature.	Must meet requirement	Form EXP-1 In addition to the submission requirement Form EXP-1, Bidders shall provide the following supporting documents: <ol style="list-style-type: none"> 1. Signed Contract Agreement, and 2. Taking-Over Certificate, Contract Completion Certificate or Performance Certificate (and, if necessary, any additional documents certified by the Employer of the concerned contract, as acceptable to the Employer), in sufficient detail to verify the contract name, value, completion time (or substantial completion), and all requirement for similarity. If the documents are other than in English, an accurate certified translation of these documents in English shall be provided. For contracts under which the Bidder participated as a Joint Venture partner or Subcontractor, only the Bidder's respective share, by value, shall be considered to			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">for Lot-1</td> <td style="width: 45%;">PKR 3,771.0 million or US\$ equivalent</td> </tr> <tr> <td>for Lot-2</td> <td>PKR 3,955.0 million or US\$ equivalent</td> </tr> </table>	for Lot-1	PKR 3,771.0 million or US\$ equivalent	for Lot-2	PKR 3,955.0 million or US\$ equivalent				
for Lot-1	PKR 3,771.0 million or US\$ equivalent							
for Lot-2	PKR 3,955.0 million or US\$ equivalent							

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Criteria		Compliance Requirements			Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
					<p>meet this requirement. The Bidders are required to complete Form EXP-1, indicating both the percentage and amount of their participation in the total contract amount. For contracts implemented by Joint Venture Contractor, if the bidder comprises the same Joint Venture, the 'Single Entity' requirements will apply. Additionally, they may be required to provide relevant details, such as joint venture (JV) or subcontract agreements, Engineer's approval of subcontractor, payment receipts etc.</p> <p>Note: The Employer will consider a "satisfactorily and substantially completed contract" as one for which Taking Over Certificate, Contract Completion Certificate or Performance Certificate (or equivalent) as acceptable by the Employer) was issued by the Employer of the concerned contract.</p>


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2.4.2 Construction Experience in Key Activities

2.4.2 (a) Must be complied with by the Bidder. In case of a Joint Venture Bidder, the Bidder or at least one of the partners must meet the requirement in the key activity. For contracts under which the Bidder participated as a Joint Venture partner, only the Bidder's designated scope of works under the contracts shall be considered to meet this requirement.

Table A

Criteria Requirement	Compliance Requirements		Documents
	Single Entity	Joint Venture	Submission Requirements
For the above or other contracts executed during the period stipulated in 2.4.1, a minimum construction experience is required in the following key activities:	Must meet requirement	Must meet requirement (mentioned below)	Form EXP-2 Form EXP-2 shall be supported by documents such as Signed Contract Agreement, Taking-Over Certificate or Contract Completion Certificate indicating the contract name, value, completion date (or percentage of substantial completion), activities performed by Joint Venture partners, certified payments showing activity details, and other relevant details sufficient to demonstrate compliance with the requirements
Lot-1: Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral			
Embankment 27,350.0 Cu.m/ in any one year	Must meet requirement	The Joint Venture as a whole must meet the requirements in full whereas each partner must meet the requirements equivalent to 30% against each Key Activity(ies)	As Above.
Base / Sub-Base 20,200.0 Cu.m/ in any one year			
Excavate Unsuitable Material 113,900.0 Cu.m/ in any one year			
Subgrade preparation in Earth Cut 35,600.0 Sq.m/ in any one year			
Plum Concrete (Class 'B' with 40% Boulders/ Rock) 48,000.0 Cu.m/ in any one year			
Concrete (in roads structures) 95,650.0 Cu.m/ in any one year			
Lot-2: Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral			
Embankment 79,900.0 Cu.m/ in any one year	Must meet requirement	The Joint Venture as a	As Above.

Criteria Requirement	Compliance Requirements		Documents
	Single Entity	Joint Venture	Submission Requirements
Base / Sub-Base 17,300.0 Cu.m/ in any one year		whole must meet the requirements in full whereas each partner must meet the requirements equivalent to 30% against each Key Activity(ies)	
Excavate Unsuitable Material 175,600.0 Cu.m/ in any one year			
Subgrade preparation in Earth Cut 62,400.0 Sq.m/ in any one year			
Plum Concrete (Class 'B' with 40% Boulders/ Rock) 58,300.0 Cu.m/ in any one year			
Concrete (in roads structures) 43,700.0 Cu.m/ in any one year			

2.4.2. (b) The Employer accepts any of the following activities to be subcontracted. They may be complied with by the Bidder or by its proposed Specialist Subcontractor.

If the key activity is to be undertaken by a Specialist Subcontractor, the Employer shall require evidence of the subcontracting agreement from the Bidder.

Table B

Criteria Requirement	Compliance Requirements		Documents
	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
For the above or other contracts executed during the period stipulated in 2.4.1, a minimum construction experience is required in the following key activities:	Must meet requirement	Must meet requirement	Form EXP-2
Lot-1: Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral			
	Must meet requirement	Must meet requirement	
Lot-2: Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral			
	Must meet requirement	Must meet requirement	

2.4.3 Specific Experience in Managing Environmental, Health and Safety Aspects

Criteria Requirement	Compliance Requirements		Documents
	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements

Criteria	Compliance Requirements		Documents
	Requirement	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors
<p>For the contracts in 4.1 and 4.2 above and/or any other contracts [substantially completed and under implementation] as prime contractor, Joint Venture partner, or Subcontractor between 1st January 2017 and Bid submission deadline, experience in managing EHS risks and impacts in the following aspects:</p> <ul style="list-style-type: none"> - Traffic management practice - Local cultural heritage protection practice - Work at height and fall protection. - Control of infectious and communicable diseases (HIV/AIDS, malaria, COVID-19 etc 	Must meet requirements.	One member must meet requirements.	Form EXP-3



(KPRR/PCB/CW07)
 Provincial Road Improvement Project
 C&W Department Peshawar

2.5 Organizational Environmental, Health and Safety System

2.5.1 Environmental, Health and Safety Certification

Criteria Requirement	Compliance Requirements		Documents
	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
Availability of a valid ISO certification or internationally recognized equivalent (equivalency to be demonstrated by the Bidder), and applicable to the worksite: 1) Quality management certificate ISO 9001 (or internationally recognized equivalent). 2) Environmental management certificate ISO 14001 (or internationally recognized equivalent). 3) Health and Safety management certificate ISO 45001 (or internationally recognized equivalent).	Must meet requirements.	All members must meet requirements.	Form EXP-4

2.5.2 Environmental, Health and Safety Documentation

Criteria Requirement	Compliance Requirements		Documents
	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
Availability of in-house policies and procedures for EHS management: 1. Existence of an Ethics Charter 2. Existence of a system for monitoring compliance with EHS commitments for the Bidder's Subcontractors and all its partners. 3. Existence of official company procedures for the management of the following: <ul style="list-style-type: none"> ➤ EHS resources and facilities and EHS monitoring system. ➤ Project Areas management information (base camps, quarries, burrow pits, storage areas). ➤ Health and Safety on worksites policy and related guidance. 	Must meet requirements.	All members must meet requirements.	Form EXP-5

2.5.3 Environmental, Health and Safety Dedicated Personnel

Criteria Requirement	Compliance Requirements		Documents
	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
Availability of in-house personnel dedicated to EHS issues: 1. Environmental Specialist 2. Occupational Health and Safety Specialist	Must meet requirements	All members must meet requirements	Form EXP-6



(KPRR/PCB/CW/07) (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

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Letter of Technical Bid

Date: **xx February 2025**

OCB No.: **KPRRDP/OCB/CW-07**

Invitation for Bid No.: **KPRRDP/OCB/CW-07**

To

The Project Director

Project Implementation Unit
Khyber Pakhtunkhwa Rural Roads Development Project
Communication and Works Department
Government of Khyber Pakhtunkhwa

Peshawar

Address: House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa Pakistan, ☎ +92-91-9216459, E-mail: pdprp.pkha@gmail.com

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.
- (b) We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.
- (c) We offer to execute in conformity with the Bidding Documents the following Works:

KPRRDP/OCB/CW-07: PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

- **Lot-1:** Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral
- **Lot-2:** Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral

[Select the Lot(s) for which you apply and delete the other]

- (d) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of **one hundred and twenty (120)** days starts from the date fixed for the bid submission deadline in accordance with ITB 22.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
- (e) Our firm, including any Subcontractors or Suppliers for any part of the Contract, have nationalities from eligible countries in accordance with ITB 4.2.
- (f) We, our directors, key officers, key personnel, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 4.3.

If there is any conflict of interest, please state details:

- (i) Parties involved in the conflict of interest: _____
- (ii) Details about the conflict of interest: _____

- (g) We are not participating, as a Bidder, either individually or as partner in a Joint Venture, in more than one Bid in this bidding process in accordance with ITB 4.3(e), other than alternative offers submitted in accordance with ITB 13.
- (h) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, are not subject to, or not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Asian Development Bank or a debarment imposed by the Asian Development Bank in accordance with the Agreement for Mutual Enforcement of Debarment Decisions between the Asian Development Bank and other development banks.¹
- (i) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, are not under ongoing investigation and/or sanctions proceedings by the Asian Development Bank or any multilateral development bank.

If under ongoing investigation and/or sanction proceedings by the Asian Development Bank or any multilateral development bank, please state details:

- (i) Name of the multilateral development bank: _____
- (ii) Reason for the ongoing investigation / allegations: _____
- (j) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the Contract, are not temporarily suspended, debarred, declared ineligible, or subject to any national and/or international sanctions by any country, any international organization, any multilateral development bank and other donor agency.

If so temporarily suspended, debarred, declared ineligible, or subject to any national and/or international sanctions by any country, any international organization, any multilateral development bank and other donor agency, please state details (as applicable to each Joint Venture partner, their respective direct or indirect shareholders, directors, key officers, key personnel, associate, parent company, affiliate, subsidiaries, Subcontractors, consultants, subconsultants, manufacturers, service providers and/or Suppliers):

- (i) Name of Institution: _____
- (ii) Period of the temporary suspension, debarment, ineligibility, or national or international sanction [start and end date]: _____
- (iii) Reason for the temporary suspension, debarment, ineligibility, or national or international sanction: _____
- (k) Our firm, Joint Venture partners, associates, parent company affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers, Suppliers, key officers, directors and key personnel have never been charged or convicted with any criminal offense (including felonies but excluding misdemeanors) or infractions and/or violations of ordinance; nor charged or found liable in any civil or administrative proceedings in the last 10 years; or undergoing investigation for such, or subject to any criminal, civil or administrative orders, monitorship or enforcement actions.

¹ These institutions include African Development Bank, European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IADB), and the World Bank Group. According to paragraph 9 of the Agreement, other international financial institutions may join upon the consent of all Participating Institutions and signature of a Letter of Adherence by the international financial institution substantially in the form provided (Annex B to the Agreement). Upon adherence, such international financial institution shall become a Participating Institution for purposes of the Agreement. Bidders are advised to check www.adb.org/integrity for updates.

If so charged, convicted/found liable, under ongoing investigation, or subject to orders, monitorship or enforcement actions, please state details:

- (i) Nature of the offense, violation, proceedings, investigation, and/or monitorship or enforcement actions: _____
- (ii) Court, area of jurisdiction and/or the enforcement agency: _____
- (iii) Resolution [*i.e. dismissed; settled; or convicted/duration of penalty*]: _____
- (iv) Other relevant details [*please specify*]: _____

- (l) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers, can make and receive electronic fund transfer payments through the international banking system or otherwise discharge the Employer's obligation upon initiation of wire transfer.

If unable to make or receive funds through the international banking system or otherwise discharge the Employer's obligation upon initiation of wire transfer, please state the details:

- (i) Nature of the restriction: _____
- (ii) Jurisdiction of the restriction: _____
- (iii) Other relevant details: _____

- (m) Our firm, Joint Venture partners, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers, key officers, directors and key personnel are not from a country which is prohibited to export goods or services to, or receive any payments from the Employer's country and/or are not prohibited to receive payments for particular goods or services by the Employer's country 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.

- (n) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract.²

Name of Recipient	Address	Reason	Amount
.....
.....

- (o) We understand that it is our obligation to notify the Employer of any changes in connection with the matters described in paragraphs (f), (h), (i), (j), (k), (l), (m) and (n) of this Letter of Technical Bid.

- (p) [We are not a government-owned enterprise] / [We are a government-owned enterprise but meet the requirements of ITB 4.5]³

- (q) We have not been suspended nor declared ineligible by the Employer based on execution of a Bid-Securing Declaration in accordance with ITB 4.6.

- (r) At any time following submission of our Bid, we shall permit, and shall cause our Joint Venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract to permit ADB or its representative to inspect our site, assets, accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB. We understand that failure of this

² If none has been paid or is to be paid, indicate "None".

³ Use one of the two options as appropriate.



obligation may constitute obstructive practice that may result in debarment and/or contract termination.

- (s) Regardless of whether the contract will be awarded to us, we shall preserve all accounts, records and other documents related to bid submission for at least 3 years from the date of submission of the bid or the period prescribed in applicable law, whichever is longer.
- (t) If we are awarded the contract, we shall preserve all accounts, records and other documents related to the procurement and execution of the contract for at least 5 years after completing the works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer.
- (u) If our Bid is accepted, we commit to mobilizing key equipment and personnel in accordance with the requirements set forth in Section 6 (Employer’s Requirements) and our technical proposal, or as otherwise agreed with the Employer.
- (v) We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Employer of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads, or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the contract, if awarded, and may result in remedial actions, in accordance with ADB’s Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2015, as amended from time to time).

Name*[insert complete name of person signing the bid]*

In the capacity of*[insert legal capacity of person signing the bid]*

Signed*[insert signature of person whose name and capacity are shown above]*

Duly authorized to sign the Bid for and on behalf of

Date *[insert date of signing]*



Letter of Price Bid

Date: **xx February 2025**

OCB No.: **KPRRDP/OCB/CW-07**

Invitation for Bid No.: **KPRRDP/OCB/CW-07**

To

The Project Director

Project Implementation Unit

Khyber Pakhtunkhwa Rural Roads Development Project

Communication and Works Department

Government of Khyber Pakhtunkhwa

Peshawar

Address: House No. 24, C/3 Circular Road, University Town Peshawar Khyber Pakhtunkhwa Pakistan, ☎ +92-91-9216459, E-mail: pdprp.pkha@gmail.com

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.
- (b) We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.
- (c) We offer to execute in conformity with the Bidding Documents the following Works:

KPRRDP/OCB/CW-07: PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

- **Lot-1:** Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral
- **Lot-2:** Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral

[Select the Lot(s) for which you apply and delete the others]

- (d) The total price of our Bid, excluding any discounts offered in item (d) below is:

[amount of foreign currency in words], [amount in figures], and [amount of local currency in words], [amount in figures]

The total bid price from the Summary of Bill of Quantities for admeasurement contracts or Activity Schedule for lump sum contracts should be entered by the bidder inside this box. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the bid.

- (e) The discounts offered and the methodology for their application are as follows: *[insert discounts and methodology for their application if any]*
- (f) Our Bid shall be valid for a period of **one hundred and twenty (120)** days starts from the date fixed for the bid submission deadline in accordance with ITB 22.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

- (g) If our Bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents.
- (h) We understand that this bid, together with your written acceptance thereof included in your notification of award through the issuance of Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed.
- (i) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (j) At any time following submission of our Bid, we shall permit, and shall cause our Joint Venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract to permit ADB or its representative to inspect our site, assets, accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB. We understand that failure of this obligation may constitute obstructive practice that may result in debarment and/or contract termination.
- (k) Regardless of whether the contract will be awarded to us, we shall preserve all accounts, records and other documents related to bid submission for at least 3 years from the date of submission of the bid or the period prescribed in applicable law, whichever is longer.
- (l) If we are awarded the contract, we shall preserve all accounts, records and other documents related to the procurement and execution of the contract for at least 5 years after completing the works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer.
- (m) We confirm and stand by our commitments and other declarations made in connection with the submission of our Letter of Technical Bid.
- (n) We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Employer of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads, or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the contract, if awarded; and may result in remedial actions, in accordance with ADB's Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2015, as amended from time to time).

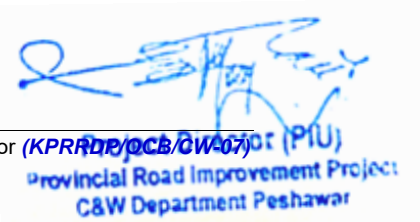
Name *[insert complete name of person signing the bid]*

In the capacity of *[insert legal capacity of person signing the bid]*

Signed *[insert signature of person whose name and capacity are shown above]*

Duly authorized to sign the Bid for and on behalf of

Date *[insert date of signing]*



Bid Security**Bank Guarantee**

[Bank's name, and address of issuing branch or office]⁴

Beneficiary:[Name and address of the Employer]

Date:

Bid Security No.:

We have been informed that [name of the Bidder] (hereinafter called "the Bidder") has submitted to you its bid dated [please specify] (hereinafter called "the Bid") for the execution of [name of contract] under Invitation for Bids No. [please specify] ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we [name of bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of [amount in words] [amount in figures] upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder

- (a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Letter of Technical Bid and Letter of Price Bid; or
- (b) does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB"); or
- (c) having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Agreement, or (ii) fails or refuses to furnish the Performance Security, in accordance with the ITB, or (iii) fails or refuses to furnish the domestic preferred security, if required.

This guarantee will expire (a) if the Bidder is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Bidder and the Performance Security issued to you upon the instruction of the Bidder; and (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy your notification to the Bidder of the name of the successful Bidder, or (ii) 28 days after the expiration of the Bidder's bid.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revisions, ICC Publication No. 758.⁵

[Authorized signature(s) and bank's seal (where appropriate)]

⁴ All italicized text is for use in preparing this form and shall be deleted from the final document.

⁵ Or the employer may use "Uniform Rules for Demand Guarantees (URDG) ICC Publication No. 458" as appropriate.

Bid-Securing Declaration

Date: *[insert date (as day, month and year)]*

Bid No.: *[insert number of bidding process]*

Alternative No.: *[insert identification No if this is a bid for an alternative]*

To: *[insert complete name of the Employer]*

We, the undersigned, declare that:

We understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

We accept that we will automatically be suspended from being eligible for bidding in any contract with the Borrower for the period of time of *[insert the number of months or years indicated in ITB 19.2 of the BDS]* starting on the date that we receive a notification from the Employer, if we are in breach of our obligation(s) under the bid conditions, because we

(a) have withdrawn our Bid during the period of bid validity specified in the Letter of Technical Bid and Letter of Price Bid; or

(b) do not accept the correction of errors in accordance with the Instruction to Bidders (hereinafter “the ITB”); or

(c) having been notified of the acceptance of our Bid by the Employer during the period of bid validity, (i) fail or refuse to execute the Contract, if required, (ii) fail or refuse to furnish the Performance Security, in accordance with the ITB, or (iii) fail or refuse to furnish the Domestic Preference Security, if required.

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) 28 days after the expiration of our Bid.

Signed: *[insert signature of person whose name and capacity are shown]*

In the capacity of *[insert legal capacity of person signing the Bid-Securing Declaration]*

Name: *[insert complete name of person signing the Bid-Securing Declaration]*

Duly authorized to sign the bid for and on behalf of *[insert complete name of the bidder]*

Dated on _____ day of _____, _____

Corporate Seal [where appropriate]



AFFILIATE COMPANY GUARANTEE

Name of Contract/Contract No.: _____
 Name and address of Employer: _____
 [together with successors and assigns].

We have been informed that [(name of Contractor)] (hereinafter called the "Contractor") is submitting an offer for the above-referenced Contract in response to your invitation, and that the conditions of your invitation require its offer to be supported by an affiliate company guarantee.

In consideration of you, the Employer, awarding the Contract to the Contractor, we [name of affiliated company] irrevocably and unconditionally guarantee to you, as a primary obligation, throughout the duration of the Contract, we will make available to the Contractor our financial, technical capacity, expertise and resources required for the Contractor's satisfactory performance of the Contract; and (ii) we are fully committed, along with the Contractor, to ensuring a satisfactory performance of the Contract.

If the Contractor fails to so perform its obligations and liabilities and comply with the Contract, we will indemnify the Employer against and from all damages, losses and expenses (including legal fees and expenses) which arise from any such failure for which the Contractor is liable to the Employer under the Contract.

This guarantee shall come into full force and effect when the Contract comes into full force and effect. If the Contract does not come into full force and effect within a year of the date of this guarantee, or if you demonstrate that you do not intend to enter into the Contract with the Contractor, this guarantee shall be void and ineffective. This guarantee shall continue in full force and effect until all the Contractor's obligations and liabilities under the Contract have been discharged, whereafter this guarantee shall expire and shall be returned to us, and our liability hereunder shall be discharged absolutely.

This guarantee shall apply and be supplemental to the Contract as amended or varied by the Employer and the Contractor from time to time. We hereby authorize them to agree on any such amendment or variation, the due performance of which and compliance with which by the Contractor are likewise guaranteed hereunder. Our obligations and liabilities under this guarantee shall not be discharged by any allowance of time or other indulgence whatsoever by the Employer to the Contractor, or by any variation or suspension of the works to be executed under the Contract, or by any amendments to the Contract or to the constitution of the Contractor or the Employer, or by any other matters, whether with or without our knowledge or consent.

This guarantee shall be governed by the law of the same country (or other jurisdiction) that governs the Contract and any dispute under this guarantee shall be finally settled under the [Rules or Arbitration provided in the Contract]. We confirm that the benefit of this guarantee may be assigned subject only to the provisions for assignment of the Contract.

Signed by:..... <div style="text-align: center;">[signature]</div> <div style="text-align: center;">[name]</div> <div style="text-align: center;">[position in parent/subsidiary company]</div>	Signed by: <div style="text-align: center;">[signature]</div> <div style="text-align: center;">[name]</div> <div style="text-align: center;">[position in parent/subsidiary company]</div>
Date:.....	

- Note -
 If permitted in accordance with ITB 32.2 of the BDS, the Bidder shall provide the Affiliate Company Guarantee Form filled out and signed by each subsidiary, parent entity, or affiliate that the Bidder submits for consideration of the Employer in determining its qualifications.

Technical Proposal

Personnel

Form PER – 1: Proposed Personnel

Bidder should provide the details of the proposed personnel and their experience record in the relevant Information Forms below for each candidate:

1.	Title of position
	Name
2.	Title of position
	Name
3.	Title of position
	Name
4.	Title of position
	Name
etc.	Title of position
	Name

-- Note --

All titles of positions will be as listed in Section 6 (Employer's Requirements).



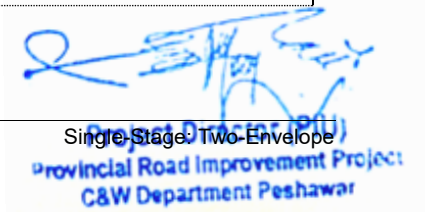
Form PER – 2: Resume of Proposed Personnel

The Bidder shall provide all the information requested below. Use one form for each position.

Position		
Personnel information	Full Legal Name	Date of birth
	Known as	Place of Birth
	Nationality	Citizenship
	Type of Government ID Attach a copy of ID to this form	ID number
	Professional qualifications	
Present employment	Name of employer	
	Address of employer	
	Telephone	Contact (manager / personnel officer)
	Fax	E-mail
	Job title	Years with present employer

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

From	To	Company / Project / Position / Relevant Technical and Management Experience



Equipment


Form EQU: Equipment

The Bidder shall provide adequate information and details to demonstrate clearly that it has the capability to meet the equipment requirements indicated in Section 6 (Employer’s Requirements), using the Forms below. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.

Item of Equipment	
Equipment Information	Name of manufacturer
	Capacity
	Model and power rating
	Year of manufacture
Current Status	Current location
	Details of current commitments
Source	Indicate source of the equipment <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured

Omit the following information for equipment owned by the Bidder.

Owner	Name of owner
	Address of owner
	Telephone
	Fax
	Contact name and title
	Telex
Agreements	Details of rental / lease / manufacture agreements specific to the project



(KPRR/PCB/CWA-07) (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

Site Organization

[Note: *Evaluation of the Bidder's Site Organization will include an assessment of the Bidder's capacity to mobilize key personnel for the Contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section 6 (Employer's Requirements).]*

Method Statement

The bidder **shall** provide detailed Method Statement of executing the project. The bidder shall also indicate the machinery to be used and key personnel showing their responsibilities.

In case of a JV, the Method Statement **shall** include clear delineation of activities / roles to be performed by each JV partner consistent with the indicated JV share in the JV Agreement.

Mobilization Schedule

The bidder shall provide graphical (Bar Chart) presentation of its mobilization schedule, harmonized with the Construction Schedule to complete the Works in the stipulated time under the contract (refer Part A-Contract Data under Section-8, Particular Conditions of Contracts). The Mobilization Schedule should reflect the no-objection request and approval step for Site-Specific Environmental, Health and Safety Management Plan as per Contract Conditions. Bidder shall provide mobilization Schedule conforming with the requirement of condition of contract Clause 14.2.

Please reflect the no-objection request and approval step for Site Specific Environmental, Health and Safety Management Plan as per Contract Conditions in the Mobilization Schedule.

Construction Schedule

[Note: *Evaluation of the Bidder's Construction Schedule will include an assessment of the Bidder's technical capacity to mobilize equipment for the Contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section 6 (Work's Requirements).]*

Bidders must provide their Construction Schedule on primavera / MS project or equivalent by allocating the equipment and other resources, critical activities must be identified.]

Environmental, Health and Safety Management Plan (EHSMP)

The Bidder shall submit an outline Environmental, Health and Safety Management Plan (EHSMP) commensurate with the risks and impacts of the proposed works and activities. These strategies and plans shall describe in detail the actions, materials, equipment, management processes etc. that will be implemented by the Contractor, and its subcontractors.

In developing these strategies and plans, the Bidder shall have regard to the EHS provisions of the contract and EHS risks including those as may be more fully described in Section 6 (Employer's Requirements).

Environmental, Health and Safety Code of Conduct

Other Documents in accordance with ITB 11.2(g) of Section 2-Bid Data Sheet

Environmental, Health and Safety Code of Conduct

Environmental, Health and Safety Code of Conduct for Contractor's Personnel Form

Note to Bidder

The minimum content of the EHS Code of Conduct form as set out by the Employer shall not be substantially modified. However, the Bidder may add requirements as appropriate, including to take into account Contract-specific issues/risks.

The Bidder shall initial and submit the EHS Code of Conduct form as part of its bid.

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

We are the Contractor, [enter name of Contractor]. We have signed a contract with [enter name of Employer] 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, labourers and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the Works. All such persons are referred to as "**Contractor's Personnel**" and are subject to this EHS Code of Conduct.


This EHS Code of Conduct identifies the behavior that we require from all Contractor'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

Contractor'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 Contractor'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.



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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 Contractor'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 Contractor'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 Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR CONTRACTOR'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 Contractor's contact person(s) with relevant experience*] requesting an explanation.

Name of Contractor's Personnel: [*insert name*]

Signature: _____

Date: [*day month year*]: _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: [*day month year*]: _____

Bidders Qualification

To establish its qualifications to perform the contract in accordance with Section 3 (Evaluation and Qualification Criteria) the Bidder shall provide the following information requested in the corresponding Information Sheets.



Form ELI - 1: Bidder's Information Sheet

Bidder's Information			
		Information of the Bidder	If the Bidder is a subsidiary or branch, information of any parent company/companies
Names	Full legal name(s)		
	Full trading name(s) (if any)		
Addresses	Registered address(es)		
	Trading address(es)		
	Postal address(es) (if different from trading address)		
Type of organization			
Country of constitution/incorporation/registration			
Year of constitution/incorporation/registration			
Corporate or registration number			
In case of a Joint Venture, legal name of each partner			
Bidder's authorized representative (name, address, telephone number(s), fax number(s), e-mail address)			
<p>Attached are copies of the following documents.</p> <ol style="list-style-type: none"> 1) In case of a single entity, articles of incorporation or constitution and company incorporation/registration of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2. 2) Authorization to represent the firm or Joint Venture named above, in accordance with ITB 20.2. 3) In case of a Joint Venture, a letter of intent to form a Joint Venture or Joint Venture agreement, in accordance with ITB 4.1. 4) In case of a government-owned enterprise, any additional documents not covered under 1 above required to comply with ITB 4.5. 			

Form ELI - 2: Joint Venture Information Sheet

Each partner of the Joint Venture and Specialist Subcontractor must fill out this form separately.

Joint Venture / Specialist Subcontractor Information		
Bidder's legal name		
	Information of Joint Venture Partner or Specialist Subcontractor	If any Joint Venture Partner or Specialist Subcontractor is a subsidiary or branch, information of any parent company/companies
Names	Full legal name(s)	
	Full trading name(s) (if any)	
Addresses	Registered address(es)	
	Trading address (es)	
	Postal address (es) (if different from trading address)	
Type of organization		
Country of constitution/incorporation/ registration		
Year of constitution/incorporation/ registration		
Corporate or registration number		
Joint Venture Partner's or Specialist Subcontractor's authorized representative information <small>(name, address, telephone number(s), fax number(s), e-mail address)</small>		
<p>Attached are copies of the following documents.</p> <ol style="list-style-type: none"> 1) Articles of incorporation or constitution and company incorporation/registration of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2. 2) Authorization to represent the firm named above, in accordance with ITB 20.2. 3) In the case of a government-owned enterprise, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB 4.5. 		



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Form CON – 1: Historical Contract Nonperformance

Each Bidder must fill out this form in accordance with Criteria 2.2.1 and 2.2.3 of Section 3 (Evaluation and Qualification Criteria) to describe any history of nonperforming contracts and pending litigation or arbitration formally commenced against it.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

Table 1: History of Nonperforming Contracts

Choose one of the following:

- No nonperforming contracts.
- Below is a description of nonperforming contracts involving the Bidder (or each Joint Venture partner if Bidder is a Joint Venture).

Year	Description	Amount of Nonperformed Portion of Contract (\$ equivalent)	Total Contract Amount (\$ equivalent)
[insert year]	Contract Identification: [indicate complete contract name/ number, and any other identification] Name of Employer: [insert full name] Address of Employer: [insert street/city/country] Reason(s) for nonperformance: [indicate main reason(s)]	[insert amount]	[insert amount]

Table 2: Pending Litigation and Arbitration

Choose one of the following:

- No pending litigation, arbitration or any other material events impacting the net worth and/or liquidity of the bidder.
- Below is a description of all pending litigation, arbitration involving the Bidder or any other material events impacting the net worth and/or liquidity of the bidder (or each Joint Venture partner if Bidder is a Joint Venture).

Year	Matter in Dispute	Value of Pending Claim in \$ Equivalent	Value of Pending Claim as a Percentage of Net Worth
[insert year]	Contract Identification, as applicable: [indicate complete contract name/ number, and any other identification] Name of Employer, parties involved in the material events impacting the net worth and/or liquidity of the bidder: [insert full name] Address of Employer, parties involved in the material events impacting the net worth and/or liquidity of the bidder: [insert street/city/country] Matter of Dispute: [indicate full description of dispute] Party who initiated the dispute: [indicate "Employer" or "Contractor"] Status: [indicate status of dispute]	[insert amount]	[insert amount]

- Note -

Table 2 of this form shall only be included if Criterion 2.2.3 of Section 3 (Evaluation and Qualification Criteria) is applicable.

Form CON – 2: EHS Performance Declaration

Each Bidder must fill out this form in accordance with Criterion 2.2.4 of Section 3 (Evaluation and Qualification Criteria).

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

In case of a Specialist Subcontractors, each Specialist Subcontractor must fill out this form and provide the Specialist Subcontractor's name:

Specialist Subcontractor: _____

Environmental and Health and Safety Performance Declaration in accordance with Section 3 (Evaluation and Qualification Criteria)			
<input type="checkbox"/> No suspension or termination of contract: An employer has not suspended or terminated a contract and/or called the performance security for a contract for reasons related to Environmental or Health and Safety performance since the date specified in Section 3 (Evaluation and Qualification Criteria), Criterion 2.5.			
<input type="checkbox"/> Declaration of suspension or termination of contract: The following contract(s) has/have been suspended or terminated and/or Performance Security called by an employer(s) for reasons related to Environmental or Health and Safety performance since the date specified in Section 3 (Evaluation and Qualification Criteria), Criterion 2.5. Details are described below:			
<input type="checkbox"/> Declaration of request for replacement of Key Environment, Health and Safety Personnel: The following contract(s) has/have experienced a request by the Employer to replace Environmental, Health and Safety Personnel for reasons related to Environmental or Health and Safety performance since the date specified in Section 3 (Evaluation and Qualification Criteria), Criterion 2.5. Details are described below:			
<input type="checkbox"/> Declaration of past fatality resulted from EHS issues on site: The following contract(s) has/have experienced a fatality resulted from EHS issues on site since the date specified in Section 3 (Evaluation and Qualification Criteria), Criterion 2.5. Details are described below:			
Year	Suspended or terminated portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and US\$ equivalent)
[insert year]	[insert amount and percentage]	Contract Identification: [indicate complete contract name/ number, and any other identification] Name of Employer: [insert full name] Address of Employer: [insert street/city/country] Reason(s) for suspension or termination: [indicate main reason(s) e.g. discharge over environmental limit, workers did not have required health and safety permits to undertake high risk work, work carried out was not adhered to approved construction methodology and quality control plan]	[insert amount]
[insert year]	[insert amount and percentage]	Contract Identification: [indicate complete contract name/ number, and any other identification]	[insert amount]



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	Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for suspension or termination: <i>[indicate main reason(s)]</i>	
...	...	<i>[list all applicable contracts]</i>
Performance Security called by an employer(s) for reasons related to EHS performance		
Year	Contract Identification	Total Contract Amount (current value, currency, exchange rate and US\$ equivalent)
<i>[insert year]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for suspension or termination: <i>[indicate main reason(s) e.g. discharge over environmental limit, workers did not have required health and safety permits to undertake high risk work, work carried out was not adhered to approved construction methodology and quality control plan]</i>	<i>[insert amount]</i>
Key EHS personnel replacement requested by the Employer for reasons related to EHS performance		
Year	Contract Identification and Reasons	Personnel replacement action and results
<i>[insert year]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for requesting for replacement: <i>[indicate main reason(s)]</i>	<i>[insert description]</i>
<i>Fatality due to EHS issues on Site</i>		
Year	Contract Identification	Follow-on actions taken by the contractor
<i>[insert year]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Description of fatality event: Causation:	<i>[insert description]</i>

Form FIN - 1: Historical Financial Performance

Each Bidder must fill out this form.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

Financial Data for Previous ___ Years PKR or US\$ Equivalent]		
Year 1:	Year 2:	Year ___:

Information from Balance Sheet

Total Assets (TA)			
Total Liabilities (TL)			
Net Worth = TA – TL			
Current Assets (CA)			
Current Liabilities (CL)			
Working Capital = CA - CL			

Most Recent Working Capital		To be obtained for most recent year and carried forward to FIN - 3 Line 1; in case of Joint Ventures, to the corresponding Joint Venture Partner's FIN - 3.
-----------------------------	--	---

Information from Income Statement

Total Revenues			
Profits Before Taxes			
Profits After Taxes			

- Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last _____ years, as indicated above, complying with the following conditions.
- 1) Unless otherwise required by Section 3 of the Bidding Document, all such documents reflect the standalone financial situation of legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries, or affiliates.
 - 2) Historical financial statements must be audited by a certified accountant.
 - 3) Historical financial statements must be complete, including all notes to the financial statements.
 - 4) Historical financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).



Form FIN - 2: Average Annual Construction Turnover

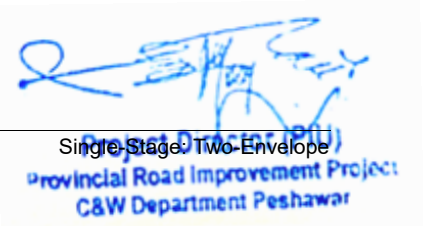
Each Bidder must fill out this form.

The information supplied should be the Annual Turnover of the Bidder or each partner of a Joint Venture for the total certified payments received from the clients for contracts in progress or completed, converted to US dollars at the rate of exchange at the end of the period reported.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

Annual Turnover Data for the Last three (03) Years (Construction only)			
Year	Amount Currency	Exchange Rate	PKR or US\$ Equivalent
Average Annual Construction Turnover			



Form FIN – 3: Availability of Financial Resources

Bidder must demonstrate sufficient financial resources, usually comprising of Working Capital supplemented by credit line statements or overdraft facilities and others to meet the Bidder's financial requirements for

- (a) its current contract commitments, and
- (b) the subject contract.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

Financial Resources		
No.	Source of financing	Amount (PKR or US\$ equivalent)
1	Working Capital (to be taken from FIN - 1)	
2	Credit Line ⁶	
3	Other Financial Resources	
Total Available Financial Resources		

⁶ To be substantiated by a letter from the bank issuing the line of credit. (i) address to the Client; (ii) shall be issued within last 02 month; (iv) it should be unconditional; and (v) credit line must be valid and available (specifying the remaining balance of the credit) to the bidder for the complete Time for Completion of the Project).

Form FIN- 4: Financial Resources Requirement

Bidders (or each Joint Venture partner) should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

Current Contract Commitments						
No	Name of Contract	Employer's Contact (Address, Tel, Fax)	Contract Completion Date	Outstanding Contract Value (X)⁷	Remaining Contract Period in months (Y)⁸	Monthly Financial Resources Requirement (X / Y)
1						
2						
3						
4						
Total Monthly Financial Requirements for Current Contract Commitments						PKR or US\$ Equivalent

⁷ Remaining outstanding contract values to be calculated from 28 days prior to the bid submission deadline (PKR or US\$ equivalent based on the foreign exchange rate as of the same date).

⁸ Remaining contract period to be calculated from 28 days prior to bid submission deadline.

Form FIN - 5: Self-Assessment Tool for Bidder’s Compliance to Financial Resources (Criterion 2.3.3 of Section 3)

This form requires the same information submitted in Forms FIN - 3 and FIN - 4. All conditions of “Available Financial Resources Net of CCC ≥ Requirement for the Subject Contract” must be satisfied to qualify.

Form FIN - 5A: For Single Entities

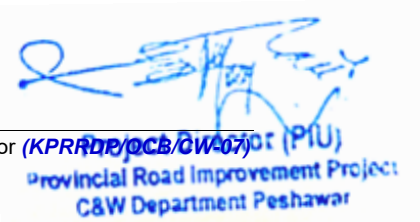
For Single Entities: (A)	Total Available Financial Resources from FIN – 3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN – 4 (C)	Available Financial Resources Net of CCC D = (B - C)	Requirement for the Subject Contract (E)	Results: Yes or No [D must be greater than or equal to E] (F)
_____ (Name of Bidder)				

Form FIN - 5B: For Joint Ventures

For Joint Ventures: (A)	Total Available Financial Resources from FIN – 3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN – 4 (C)	Available Financial Resources Net of CCC D = (B - C)	Requirement for the Subject Contract (E)	Results: Yes or No [D must be greater than or equal to E] (F)
One Partner:					
_____ (Name of Partner)				
Each Partner:					
_____ (Name of Partner 1)				
_____ (Name of Partner 2)				
_____ (Name of Partner 3)				
All partners combined	Σ D = Sum of available financial resources net of current contract commitments for all partners		Σ D = _____	

- Note -

Form FIN – 5 is made available for use by the bidder as a self-assessment tool, and by the Employer as an evaluation work sheet, to determine compliance with the financial resources requirement as stated in 2.3.3. Failure to submit Form FIN - 5 by the Bidder shall not lead to bid rejection.



Form EXP – 1: Contracts of Similar Size and Nature

Fill up one (1) form per contract. Each contract shall be supported by documents such as Signed Contract Agreement or Certificate of Completion of the Works.

The exchange rate to be used to calculate the value of the contract for conversion to a specific currency shall be the selling rate of the Borrower's Central bank on the date of the contract.

Contract of Similar Size and Nature			
Contract No of	Contract Identification		
Award Date		Completion Date	
Total Contract Amount	PKR or US\$ Equivalent		
If partner in a Joint Venture or Subcontractor, specify participation of total contract amount	Percent of Total	Amount	
Employer's name Address Telephone number Fax number E-mail			
Description of the Similarity in Accordance with Criterion 2.4.1 of Section 3 (Evaluation and Qualification Criteria)			
The similarity of the Bidder's participation shall be based on: 1. the physical size 2. nature of works 3. complexity, methods 4. technology or 5. other characteristics			

Form EXP - 2: Construction Experience in Key Activities

Fill up one (1) form per contract. Each contract shall be supported by documents such as Signed Contract Agreement or Certificate of Completion of the Works.

Each Bidder must fill out this form.

If complied by Specialist Subcontractor, each Specialist Subcontractor must fill out this form and provide the Specialist Subcontractor's name:

Specialist Subcontractor: _____

Contract with Similar Key Activities			
Contract No of	Contract Identification		
Award Date		Completion Date	
Total Contract Amount	PKR or US\$ Equivalent		
If partner in a Joint Venture or Subcontractor, specify participation of total contract amount	Percent of Total	Amount	
Employer's name Address Telephone number Fax number E-mail			
Description of the Key Activities in Accordance with Criterion 2.4.2 of Section 3 (Evaluation and Qualification Criteria)			
Construction experience is required in the following key activities:			



Form EXP – 3: Specific Experience in Managing Environmental, Health and Safety Aspects

Fill out one form per contract.

Each Bidder must fill out this form.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

1. Key Requirement No. 1 in accordance with Criterion 2.4.3 of Section 3: _____

Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in Joint Venture <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Subcontractor <input type="checkbox"/>
Total Contract Amount			PKR or US\$ Equivalent...	
Details of relevant experience				

2. Key Requirement no 2 in accordance with Criterion 2.4.3 of Section 3: _____

3. Key Requirement no 3 in accordance with Criterion 2.4.3 of Section 3: _____

Form EXP – 4: Environmental, Health and Safety Certification

Please provide the following information:

Availability of the following valid ISO certification or internationally recognized equivalent (equivalency to be demonstrated by the Bidder), and applicable to the worksite:

[Select the required certifications from below⁹]

- Quality management certificate ISO 9001
- Environmental management certificate ISO 14001
- Health and Safety management certificate ISO 45001

Form EXP – 5: Environmental, Health and Safety Documentation

Please provide the following information:

Availability of in-house policies and procedures acceptable to the Employer for EHS management:

1. Existence of an Ethics Charter.
2. Existence of a system for monitoring compliance with EHS commitments for the Bidder's Subcontractors and all its partners.
3. Existence of official company procedures for the management of the following relevant points:

[Select 3-5 that apply for the worksite from below options- as per Section 2]

- EHS resources and facilities and EHS monitoring system.
- Project Areas management information (base camps, quarries, burrow pits, storage areas).
- Health and Safety on worksites policy and related guidance.
- Local recruitment and EHS trainings of local staff/subcontractors/local partners.
- Community stakeholder engagement practice.
- Traffic management practice.
- Hazardous products management practice.
- Waste management practice.
- Protection of water resources.
- Biodiversity protection practices.
- Site rehabilitation and revegetation practice.
- Local cultural heritage protection practice.
- Erosion and sedimentation practices.
- Control of infectious and communicable diseases (HIV/AIDS, malaria, COVID-19 etc)

⁹ Depending on the environmental, health and safety issues of the worksite and the type of competition planned (national or international), the list of required certifications may be restricted to those corresponding to the main issue of the worksite management or removed altogether.

Form EXP – 6: Environmental, Health and Safety Dedicated Personnel

Please provide CV {Form PER-2} of the in-house personnel of the main contractor/Joint Venture partners for the EHS positions specified in Section 6 (Employer's Requirements):

- Environmental Specialist
- Health and Safety Specialist

Schedules

Schedule of Payment Currencies

For:

KPRRDP/OCB/CW-07: PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

➤ **Lot-1:** Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral

Separate tables may be required if the various sections of the Works (or of the Bill of Quantities) will have substantially different foreign and local currency requirements. In such a case, the Employer should prepare separate tables for each Section of the Works.

	A	B	C	D
Name of Payment Currency	Amount of Currency	Rate of Exchange to Local Currency	Local Currency Equivalent C = A x B	Percentage of Net Bid Price (NBP) $\frac{100 \times C}{NBP}$
Local Currency		1.00		
Foreign Currency #1				
Foreign Currency #2				
Foreign Currency #3				
Net Bid Price				100.00
Provisional Sums Expressed in Local Currency	To be entered by the Employer	1.00	To be entered by the Employer	
BID PRICE				

- Note -

The rates of exchange shall be the selling rates 28 days prior to the deadline for submission of bids published by the source specified in BDS 15.

The bidder is required to substantiate and rationalize the justification of the Foreign Currency Component.

- The Foreign Currency Component shall be payable on actual expenditures by the Contractor and in accordance with BDS 15.

- Actual expenditures and receipts on the name of the Contractor shall include but not limited to:

- a) For Equipment and Spare Parts: Lading / L. C. Papers, sale-purchase documents. Evidence of mobilization of equipment at project site etc.
- b) For Staff: The master payroll, evidence of presence of staff at project site. Payment / withdrawal of salary i.e. cross-check-bank account details

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Schedule of Payment Currencies

For:

KPRRDP/OCB/CW-07: PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

➤ **Lot-2: Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral**

Separate tables may be required if the various sections of the Works (or of the Bill of Quantities) will have substantially different foreign and local currency requirements. In such a case, the Employer should prepare separate tables for each Section of the Works.

	A	B	C	D
Name of Payment Currency	Amount of Currency	Rate of Exchange to Local Currency	Local Currency Equivalent C = A x B	Percentage of Net Bid Price (NBP) $\frac{100 \times C}{NBP}$
Local Currency		1.00		
Foreign Currency #1				
Foreign Currency #2				
Foreign Currency #3				
Net Bid Price				100.00
Provisional Sums Expressed in Local Currency	To be entered by the Employer	1.00	To be entered by the Employer	
BID PRICE				

-- Note --

The rates of exchange shall be the selling rates 28 days prior to the deadline for submission of bids published by the source specified in BDS 15.

The bidder is required to substantiate and rationalize the justification of the Foreign Currency Component.

- The Foreign Currency Component shall be payable on actual expenditures by the Contractor and in accordance with BDS 15.
- Actual expenditures and receipts on the name of the Contractor shall include but not limited to:
 - c) For Equipment and Spare Parts: Lading / L. C. Papers, sale-purchase documents. Evidence of mobilization of equipment at project site etc.
 - d) For Staff: The master payroll, evidence of presence of staff at project site. Payment / withdrawal of salary i.e. cross-check-bank account details

Tables of Adjustment Data

Table A - Local Currency

KPRRD/OCB/CW-07: PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

➤ **Lot-1:** Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral

S/No	Description	Unit	Weightages	Applicable Index
1	2	3	4	5
(a)	Fixed Portion	-	0.48	-
(b)	High Speed Diesel [for all types of fuel]	Liter	0.15	Monthly Statistical Bulletin, Pakistan Bureau of Statistics / Pakistan State Oil
(c)	Labour Unskilled [for all types of labour]	Day (Per Day)	0.10	Monthly Statistical Bulletin, Pakistan Bureau of Statistics GOP (District: Chitral)
(d)	Cement (Ordinary Portland Cement) [for all types of Cement]	Metric Ton	0.21	Monthly Statistical Bulletin, Pakistan Bureau of Statistics GOP (District: Chitral)
(e)	Iron Bar (M.S. Bar) 1/2" [for all types of Steel elements]	Metric Ton	0.06	Monthly Statistical Bulletin, Pakistan Bureau of Statistics GOP (District: Chitral)
(f)	Asphalt Cement in Bulk Penetration Grade 60/70 or 80/100 (in bulk)	Metric Ton	0.00	National Refinery, Karachi.
Total			1.00	

Note:

1. Base prices of Specified Material shall be as of actually prevailing market on the base date notified by the Project Manager with the approval of the Employer after the award of works. The Base Date means the date 28 days prior to the deadline for the bid submission.
2. The basic material prices are meant to be ex-factory prices and inclusive all kinds of taxes and duties that can be levied at source.
3. Adjustment of increase/ decrease shall only be admissible for the materials listed above.
4. All amounts shall be in Pakistani Rupees.
5. Value of work done for escalation purpose shall be value of permanent works (excluding bill for General items and Provisional sums)
6. The proposed weightages of bidders exceeding the upper limit shall not be permitted. If weightages proposed by the bidder exceed the limit/acceptable range specified above, it shall not be a cause of bid rejection; however, the coefficients will be finalized before contract award after justification by bidder.



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Tables of Adjustment Data
Table A - Local Currency

KPRRDP/OCB/CW-07: PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

➤ **Lot-2: Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral**

S/No	Description	Unit	Weightages	Applicable Index
1	2	3	4	5
(a)	Fixed Portion	-	0.50	-
(b)	High Speed Diesel [for all types of fuel]	Liter	0.15	Monthly Statistical Bulletin, Pakistan Bureau of Statistics / Pakistan State Oil
(c)	Labour Unskilled [for all types of labour]	Day (Per Day)	0.10	Monthly Statistical Bulletin, Pakistan Bureau of Statistics GOP (District: Chitral)
(d)	Cement (Ordinary Portland Cement) [for all types of Cement]	Metric Ton	0.20	Monthly Statistical Bulletin, Pakistan Bureau of Statistics GOP (District: Chitral)
(e)	Iron Bar (M.S. Bar) 1/2" [for all types of Steel elements]	Metric Ton	0.05	Monthly Statistical Bulletin, Pakistan Bureau of Statistics GOP (District: Chitral)
(f)	Asphalt Cement in Bulk Penetration Grade 60/70 or 80/100 (in bulk)	Metric Ton	0.00	National Refinery, Karachi.
Total			1.00	

Note:

1. Base prices of Specified Material shall be as of actually prevailing market on the base date notified by the Project Manager with the approval of the Employer after the award of works. The Base Date means the date 28 days prior to the deadline for the bid submission.
2. The basic material prices are meant to be ex-factory prices and inclusive all kinds of taxes and duties that can be levied at source.
3. Adjustment of increase/ decrease shall only be admissible for the materials listed above.
4. All amounts shall be in Pakistani Rupees.
5. Value of work done for escalation purpose shall be value of permanent works (excluding bill for General items and Provisional sums)
6. The proposed weightages of bidders exceeding the upper limit shall not be permitted. If weightages proposed by the bidder exceed the limit/acceptable range specified above, it shall not be a cause of bid rejection; however, the coefficients will be finalized before contract award after justification by bidder.

Table B - Foreign Currency Payment

Name of Currency:

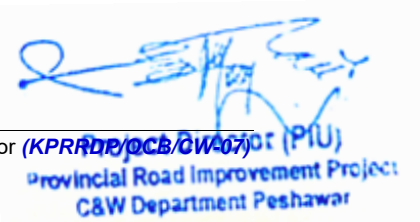
[Insert name of currency. If the Bidder wishes to quote in more than one foreign currency, this table should be repeated for each foreign currency such as #1, #2 and #3.]

To be entered by the Bidder				
Index Code	Index Description	Source of Index	Base Value and Date	Bidder's Proposed Weighting (coefficient)
L: Labor	Nonadjustable	—	—	a: _____
E: Equipment				b: _____
M1: Material 1				c: _____
M2: Material 2				d: _____
...etc...				e: _____
				1.00

*To be entered by the Bidder.
(Employer may prescribed the range of weighing)*

-- Notes --

- "Base Date" means the date 28 days prior to the deadline for submission of bids.
- For a given currency, the "Source of Index" should be issued or published within the country to which the currency relates.
- Tables of Adjustment Data shall only be included if prices are to be quoted as adjustable prices in accordance with ITB 14.5.



Bill of Quantities

A. Preamble

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Particular Conditions of Contract, Technical Specifications and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Project Manager and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Project Manager may fix within the terms of the Contract.
3. The rates and prices bid in the priced Bill of Quantities shall, except as otherwise provided under the Contract include all construction equipment, labour, supervision, materials, erection, maintenance, insurance, profit, taxes and duties; together with all general risks, liabilities and obligations set out or implied in the Contract. Furthermore, all duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.
4. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor has failed to enter a rate or price shall be deemed covered by other rates and prices entered in the Bill of Quantities. The units and rates in figures entered into the Bill of Quantities should be typewritten; and written by hand, must be in print form. A Bill of Quantities not presented accordingly may be considered nonresponsive.
5. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of the Work.
6. General directions and descriptions of works and materials are not necessarily repeated or summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities
7. Provisional Sums if included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Project Manager in accordance with the Conditions of Contract.
8. The "Ref Specs" mentioned in the Bill of Quantities indicates the Technical Specifications section number(s) which are to be followed during execution of item of work in accordance with the applicable drawings.
9. Unless otherwise stated in the text of the priced Bill of Quantities, the quantities have to be measured and paid in accordance with the Measurement and Payment Clauses given in the relevant Technical Specifications or in accordance with implied meaning of the

specifications. Any special method of measurement stated in the text of priced Bill of Quantities is limited to the concerned items only.

10. All rates and amounts are in Pakistani Rupees. For the purpose of clarity, it is elaborated regarding Serial No. 03 of Preamble to this Bill of Quantities, the Contractor is expected to consider all applicable, provincial and federal, direct and indirect taxes, in accordance with the relevant laws of Pakistan, in their rates against each item of the Bill of Quantities for example: Provincial Sales Tax, General Sales Tax (GST), Duties, Levies etc.
11. Note: The bid price is inclusive of all Environmental, Health and Safety management and compliance cost.
12. Arithmetic errors will be corrected by the Employer as follows:
 - a) If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected.
 - b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail, and the total shall be corrected.
 - c) If there is a discrepancy between the bid price in the Summary of Bill of Quantities and the bid amount in item (c) of the Letter of Bid, the bid price in the Summary of Bill of Quantities will prevail and the bid amount in item (c) of the Letter of Bid will be corrected.
 - d) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a), (b), and (c) above.
13. Rock is defined as all materials that, in the opinion of the Project Manager, require blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for their removal, and that cannot be extracted by ripping with a tractor of at least 150 brake horsepower with a single, rear-mounted, heavy-duty ripper.
14. A specific Provisional Sum for the work of the Adjudicator shall be used to cover the Employer's share (50%) of the Adjudicator fees and expenses, in accordance with Clause 29 [Appointment of the Adjudicator]. Notwithstanding the foregoing, no prior instruction of the Project Manager shall be required for use of this specific Provisional Sum. The Contractor shall submit the Adjudicator invoices and satisfactory evidence of having paid 100% of such invoices as part of supporting documents of those Statements submitted under Sub-Clause 49 [Payment Certificates]. No overhead and profit shall be paid to the Contractor in respect of this Provisional Sum. Alternately, the Employer may decide to include the Adjudicator fees and expenses under Provisional Sums for contingency.

B. Work Items

1. Bill of Quantities (BOQs) are attached.
2. Bidders shall Price the Bill of Quantities in Pakistani Rupees Only.

BOQs Attached



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Section 5: Eligible Countries

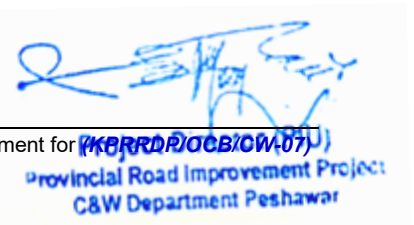
This section contains the list of eligible countries.

Eligible countries are limited to all ADB members listed at www.adb.org/about/members, other than any restrictions arising from ITB 4.8.

Section 6: Employer's Requirements

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Specifications

GENERAL SPECIFICATIONS

Part-I General Specifications shall comprise the General Specification (March 1998 and addendum issued), published by the National Highway Authority with such deletions, additions and other revisions as here below described. These General Specifications are part II of the Bidding Documents.

These are provided under Volume II of the Bidding Documents.

Environment, Health and Safety Management Requirement

Attached.



**Drawings
Attached.**



Supplementary Information

PART I SPECIAL SPECIFICATIONS

PART II SPECIAL PROVISIONS

**PART III METHOD OF MEASUREMENT FOR SPECIAL ITEMS
OF WORK**



PART I SPECIAL SPECIFICATIONS

CONTENTS

	Introduction
SS-1	Sulphate Resistant Cement Concrete
SS-2	Top Soil Management
SS-3	Earthworks Management and Water Quality Protection
SS-4	Erosion Control
SS-5	Contractors Camps and Depots
SS-6	Protection of Agricultural and Horticultural Land
SS-7	Protection of Residential Land
SS-8	Protection of Business and Other Lands
SS-9	Protection of Air Quality
SS-10	Protection of Trees and Amenity
SS-11	Staff Awareness of Environmental Safeguards
SS-12	Public Complaints Register
SS-13	Monitoring and Recording
SS-14	Project Environmental Management Implementation Plan

SPECIAL SPECIFICATIONS

INTRODUCTION

These special specifications shall be used as supplementary and in conjunction with other construction contract documents and shall be deemed to be incorporated and become part of the contract documents. In case any General Specifications are at variance with any of Special Specifications, the Special Specifications shall prevail.

SS-1 SULPHATE RESISTANT CEMENT CONCRETE

1.1 Description

This work shall consist of providing sulphate resistant cement in place of Portland cement to all classes of concrete mentioned in Item 401 of General Specification subject to the contact with soil having sulphate content more than 1% and with Ground Water having sulphate content more than 1500 ppm or as mentioned in the drawing or directed by the Project Manager.

1.2 Material Requirements

(a) Cement

Sulphate resistant cement where required shall be sulphate resistant cement type 'A' fully conforming to Pakistan Standard Specification PS No. 612 1967 and satisfying to requirements for fineness, chemical composition, strength, setting time and soundness etc. The average compressive strength of three mortar cubes prepared with 1:3 cement and standard silica sand mortar shall not be less than 20.0 N/sq.mm. at seven days. The initial setting time shall not be less than 45 minutes and final setting time not more than 10 hours.

(b) Aggregate

Fine and coarse aggregate shall be as specified in Item 401 of General Specifications.

(c) Water

Water shall be as specified in Article 401 of General Specifications.

1.3 Construction Requirements


The construction requirements of concrete with sulphate resistant cement shall be fully as specified in Item 401 of General Specifications.

1.4 Measurement and Payment

The quantity of concrete with sulphate resistant cement shall be measured exactly in same way as mentioned in Item 401 of General Specifications and subsequently paid as elaborated under Item 401 of General Specifications.

1.5 Payment

Payment shall be made as entered in the Bill of Quantities for ordinary Portland cement concrete items. In addition to that the difference in cost between ordinary and sulphate resistant cement shall be paid as compensation for the use of sulphate resistant cement.



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SS-2 TOP SOIL MANAGEMENT


The Contractor will:

1. strip and stockpile for further use such top soil as can be identified on the area that will be subject to excavation and disturbance; and
2. ensure that the stockpile is suitably bunded to prevent topsoil washing from the stockpile site; and
3. ensure that the stockpile does not become a site for dust generation by sowing it to suitable grass species if the stockpile is likely to remain in situ for a period in excess of 6 months; or
4. ensure that it is regularly watered if it is likely to remain in situ for less than 6 months; and
5. ensure that the stockpile site is located at least 30m distant from any waterway; and
6. ensure that any weeds that germinate on the stockpile are controlled with an acceptable herbicide.

SS-3 EARTHWORKS MANAGEMENT AND WATER QUALITY PROTECTION

The Contractor will:

1. ensure that excavated material that is in excess of requirements for fill materials is disposed of on sites that are located not nearer than 50m to any watercourse to the satisfaction of the Project Manager. The following exception may apply in specified circumstances:
 - 1.1 rock and stone material that is not likely to contribute to an increased in sediment loads in watercourses may be disposed of below the road when there will be no impact on any land managed for agricultural, horticultural or business purposes or used for residential purposes; and
 - 1.2 if there are likely to be any such impacts the action will only be permitted with the prior agreement of the landholder and occupier and the Project Manager and evidence of such agreements must be provide by the Contractor on request; and
 - 1.3 he earth / rock moving activity must not exacerbate any erosion potential, damage the road fill or any retaining structures or increase the risks of floods in any watercourse.
2. ensure that adequate drainage is provided for surface water to flow under or around the construction site so that it does not cause erosion on any excavated or disturbed and rehabilitated sites; and
3. ensure that all drainage channels are adequately protected so that they are not subject to water scour or erosion; and
4. ensure that all drainage channels and protection are installed prior to commencement of earthworks except with the specific prior agreement of the Project Manager; and



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5. ensure that sediment fences, hay bales and other measures as agreed with the Project Manager are correctly installed prior to excavation and disturbance and maintained so as to minimise transport of sediment from the construction site into adjoining waterways; and
6. ensure that sediment material that is recovered from sediment control structures is disposed of at sites at least 30m distant from any waterways; and
7. ensure that any alterations to drainage channels within the ROW are undertaken in accordance with Special Provision SP-10 – Relocation of Water Courses within the ROW; and
8. ensure that embankment construction in pond areas is undertaken in accordance with Special Provision SP-8 – Construction of Embankments in Pond Areas; and
9. ensure that if any access along canal roads is required it shall be undertaken in accordance with Special Provision SP. Access and Canal Roads and shall include measures to prevent pollution of canal water by construction activities and vehicles, plant and machinery using the road.


SS-4 EROSION CONTROL

The Contractor will :

1. limit the extent of excavated, disturbed and unrehabilitated land so as to minimise the erosion risk from the project. The permissible extent of such area will be agreed with the Project Manager according to seasonal conditions; and
2. ensure prompt rehabilitation of excavated and disturbed sites by experienced trained staff following completion of roadworks. Such rehabilitation will include the following:
 - 2.1 spreading of top soil that has been stockpiled in accordance with SS-2; and
 - 2.2 prompt establishment of fast growing grass, shrub and tree species that are suitable for the site (see Accompanying Note 1). Such plants shall be established in accordance with Special Provision SP-9 – Furnishing and Planting Trees; and
3. ensure that bunds and diversion drains are installed around the construction site prior to excavation and disturbance so that surface run-off external to the construction site does not enter the site; and
4. ensure that such headwalls, retaining walls, revetments and other such structures are erected prior to excavation and disturbance in agreement with the Project Manager.

SS-5 CONTRACTORS CAMPS AND DEPOTS

The Contractor will ensure that any camps and depots that are erected will comply with the following:




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1. the Project Manager will provide his agreement as to the suitability of the site for its intended purpose. Factors to consider in determining suitability will include :
 - 1.1 availability of services such as electricity, sanitation and potable water; and
 - 1.2 adequate capacity to allow parking of plant and machinery within a lockable compound to ensure after hours security; and
 - 1.3 adequate capacity to ensure that all materials can be stored within the depot area; and
 - 1.4 vehicular and machinery access that meets safety requirements for Contractor and sub-contractor staff and other road users; and
 - 1.5 compatibility with adjacent land uses so that use of the site will not cause undue disturbance to neighbours; and
2. all refuelling and servicing of plant and machinery shall only be undertaken within an area that has an impervious surface and adequate bunding to prevent any spills from leaving the depot site; and
3. unpaved surfaces will be regularly watered to ensure that they do not become sources of dust; and
4. following completion of the road works camp sites will be cleared and rehabilitated.

SS-6 PROTECTION OF AGRICULTURAL AND HORTICULTURAL LAND

The Contractor will ensure that the road works are undertaken in a manner that recognises the value and limited extent of agricultural and horticultural land. In particular the Contractor will.

1. ensure compliance with General Conditions – Interference with Traffic and Adjoining Properties; and
2. plan and undertake the road works, drainage works and other ancillary works in a manner that minimises impacts on agricultural and horticultural land and associated infrastructure such as irrigation works; and
3. ensure that any works to provide temporary alterations to irrigation flow are undertaken in accordance with Special Provision SP-10 – Irrigation Flow; and
4. plan and undertake the road works and other works so as not to cause and adverse impacts on surface water drainage on such land; and
5. consult with and obtain the agreements of the land holder and occupier and the Project Manager prior to undertaking any works or excavations that will have an impact on such land and infrastructure; and
6. promptly rectify any damage to agricultural lands and horticultural lands or infrastructure to the satisfaction of the Project Manager Damage to Services, Earthworks, etc.



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SS-7 PROTECTION OF RESIDENTIAL LAND

The Contractor will ensure that the road works are planned and undertaken in a manner that recognises the presence of dwellings and residential land in close proximity to the road works. In particular the Contractor will.

1. ensure compliance with General Conditions – Interference with Traffic and Adjoining Properties; and
2. plan and undertake the road works, drainage works and other ancillary works in a manner that minimises impacts on dwellings and residential land and associated infrastructure such as access roads and tracks; and
3. plan and undertake the road works and other works so as not to cause and adverse impacts on surface water drainage on such land; and
4. plan and undertake the road works and other works so as not to cause any reduction in the amenity of residents. In particular the Contractor will ensure that measures are put in place to mitigate adverse impacts from dust, noise and vibration; and
5. consult with and obtain the agreements of the land holder and occupier and the Project Manager prior to undertaking any works or excavations that will have an impact on such land and infrastructure; and
6. promptly rectify any damage to such land and dwellings and associated buildings to the satisfaction of the Project Manager and in accordance with Special Provision SP-14 – Making Good Damage to Services, Earthworks, etc.

SS-8 PROTECTION OF BUSINESS AND OTHER LANDS

The Contractor will ensure that the road works are planned and undertaken in a manner that recognises the presence of businesses and other land uses close proximity to the road works. In particular the Contractor will.

1. ensure compliance with General Conditions – Interference with Traffic and Adjoining Properties; and
2. plan and undertake the road works, drainage works and other ancillary works in a manner that minimises impacts on businesses (including access for customers and delivery vehicles) and other land uses in bazaars and elsewhere along the road; and
3. plan and undertake the road works and other works so as not to cause any adverse impacts on surface water drainage on such land; and
4. consult with and obtain the agreements of the land holder and occupier and the Project Manager prior to undertaking any works or excavations that will have an impact on such land and infrastructure; and
5. promptly rectify any damage to such land and dwellings and associated buildings to the satisfaction of the Project Manager and in accordance with Special Provision SP-14 – Making Good Damage to Services, Earthworks etc; and



6. plan and undertake the road works and other works so as not to cause any adverse impacts from noise, dust and vibration.

SS-9 PROTECTION OF AIR QUALITY

The Contractor will ensure that the road works are planned and undertaken in a manner that minimises adverse impacts on air quality in the vicinity of the project. In particular the Contractor will.

1. ensure that dust controls as specified in SS-2, SS-5, SS-7 and SS-8 are implemented to the satisfaction of the Project Manager; and
2. ensure that all vehicles, plant and machinery used in conjunction with all aspects of the project are not causing any visible air pollution; and
3. ensure that any fires lit in conjunction with the project do not cause any loss of amenity for surrounding residents.

SS-10 PROTECTION OF TREES AND AMENITY

The Contractor will ensure that the road works are planned and undertaken in a manner that minimises adverse impacts on the existing visual amenity of the project area. In particular the Contractor will ensure that:

1. trees are only removed once the requirement for the removal has been clearly established and no design or construction alternatives are available;
2. no trees are removed without the prior agreement of the Project Manager; and
3. the products of any removed trees are disposed of in accordance with the directions of the Project Manager; and
4. trees that every tree that is removed shall be replaced by 2 trees with similar amenity potential provided (see Accompanying Note 2) and established in accordance with Special Provision SP-9 – Furnishing and Planting Trees;

SS-11 STAFF AWARENESS OF ENVIRONMENTAL SAFEGUARDS


The contractor is responsible for informing employees and subcontractors of their environmental obligations, and for ensuring that employees are adequately experienced and properly trained to conduct the works in a manner to minimise environmental impact. Therefore the Contractor will:

1. ensure that all Contractor and Sub-contractor staff are aware of the Special Environmental Provisions and their role in implementing them; and
2. provide environmental site induction for all sub-contractors and employees; and
3. maintain records of all staff that have attended training sessions; and
4. ensure that no personnel are permitted on the work site who have not attended an environmental induction.

SS-12 PUBLIC COMPLAINTS REGISTER

The Contractor will:

1. maintain an up to date register of public complaints. The register will record details of the following:



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- 1.1 name, address and telephone number of the person or business making the complaint; and
 - 1.2 date of the complaint; and
 - 1.3 nature of the complaint; and
 - 1.4 person to whom the complaint was referred to action; and
 - 1.5 proposed action to address the complaint; and
 - 1.6 date of completion of action to address the complaint; and
 - 1.7 date of advice to complainant that action has been undertaken.
2. ensure that the register is made available to the Project Manager for his inspection upon request.

SS-13 MONITORING AND RECORDING

The Contractor will:

1. provide the Project Manager with a regular status report on the implementation of the SEPs during the currency of the contract. The reports will include details of:
 - 1.1 all environmental aspects of the project including : construction update summary; and
 - 1.2 developing environmental issues; and
 - 1.3 mitigation measures implemented; and
 - 1.4 effectiveness of control measures;
 - 1.5 maintenance of controls;
 - 1.6 results of monitoring;
 - 1.7 audit results and corrective action; and
 - 1.8 environmental induction and training; and
 - 1.9 complaints summary
2. undertake regular and routine audits and inspections of environmental mitigation measures in consultation with the Project Manager. :
3. maintain a record of measurements and inspections that includes:
 - 3.1 records of measurements; and
 - 3.2 photographs of mitigation measures; and
 - 3.3 records of requests to rectify problems; and
 - 3.4 records that problems have been rectified; and
4. provide copies of all records to the Project Manager upon request.

SS-14 PROJECT ENVIRONMENTAL MANAGEMENT IMPLEMENTATION PLAN



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The Contractor will develop and implement a Project Environmental Management Implementation Plan (PEMIP) to the satisfaction of the Project Manager. The EMIP will.

1. provide details of how the SEPs will be implemented and managed on site; and
2. how the Contractor will mitigate construction impacts; and
3. document the Contractor's response to inspecting, monitoring, verifying, internal auditing and correcting or improving environmental performance; and
4. provide a schedule of environmental management requirements for each identified issue including reference to the :
 - 4.1 item number as identified in the corresponding EMP schedule; and
 - 4.2 action required to implement the EMP measure; and
 - 4.3 inspection and test frequency; and
 - 4.4 acceptance criteria; and
 - 4.5 evidence; and
 - 4.6 Contractor's responsible staff; and
5. Describe the document control system to be applied to the contract.

Accompanying Note No. 1 :

Plant species for rehabilitation of disturbed and excavated sites.

The following species mix / planting escapement is recommended :

- ◆ Tree / shrub species mix to comprise a mixture of 50% Robinia, 40% Ailanthus and 10% other evergreen broad leaved species planted at intervals of 3m x 3m intervals as measured horizontally. Other evergreens could include suitable species of Acacia and / or Albizia.
- ◆ Grass species mix comprising a mixture of Kabal (*Cynodon dactylon*) and Pesholamai (*Cenchrus setigerous*). The grasses should be planted at intervals of 0.6. x 0.6m between the tree / shrub species.

Accompanying Note No. 2 :

Plant species to provide avenue effect.

The following species mix / planting espacement is recommended :

- ◆ Tree species mix to comprise a mixture of 40% Forest Red Gum (*Eucalyptus tereticornis*), 40% Lemon Scented Gum (*Eucalyptus citriodora*) and 20% Chinar planted at 5m intervals parallel to the road alignment.

Section II – Special Provisions

INTRODUCTION

These Special Specification shall be used as supplementary and in conjunction with other construction contract documents and shall be deemed to be incorporated and become part of the contract documents. In case any General Specifications are at variance with any of Special Provisions, the Special Provisions shall prevail.

SP-1 DETOUR ROADS AND TRAFFIC CONTROL DEVICES

1.1 Detour Roads

The Contractor shall conduct his operations to ensure the least possible obstruction and inconvenience to the public. He shall have under construction no greater length or amount of work than he can execute properly with due regard to the rights of the public. The method of construction and maintenance of the detour shall be as approved by the Project Manager in writing. The detour shall consist of natural surface, properly graded and compacted, and later maintained by watering and rolling as required by the Project Manager and to his satisfaction, for smooth passage of the road traffic. Detours shall be properly maintained at all times to the satisfaction of the Project Manager's Representative.

1.2 Traffic Control Devices

The Contractor shall furnish and maintain for the control of traffic signs, barricades, and flagmen as are necessary for the movement of the traffic. The Contractor shall prepare and submit to the Project Manager's Representative for his approval, sketches outlining in detail the locations, types, numbers of traffic signs, barricades, warning lights and flagmen he proposes to utilise for the traffic control. The contractor shall work according to instructions given by the Project Manager's Representative.

- 1.2.1** Normal size of the board shall be 1.2 m x 1.2 m square shaped plywood material with black letter painted with reflective paint on a yellow background. Letters shall be minimum of 12 cm in height. Signs shall be placed at 100 meters interval, commencing 500 meters from the starting point of the work site. The sign shall be placed approximately 2 meters on the right side and 1.5 meter above the edge of the pavement and facing the incoming traffic. Typical wordings to be written on the signboards shall be:

DIVERSION AHEAD, FLAGMEN AHEAD, MEN WORKING, SLOW AND STOP, ROAD CLOSED AHEAD. In addition, other warning–or regulatory signs shall be developed and located as the Project Manager may direct.

1.3 Barricades

Wooden cross bars, nominally 25 cm x 2 cm and 1.2 meter wide shall be painted diagonally with reflective paints in 15 cm width in black and white alternating stripes and mounted on 15 cm wooden pegs, 1.2 meter high, fastened to a suitable base platform. If necessary for

stability, the base shall be weighted with sand bags, rocks or other materials. Barricades shall be located on the roadway not more than 100 meters from each site of construction.

1.4 Warning Light

Warning lights shall be of a design approved by the Project Manager's Representative. Normally, warning lights shall be placed on all barricades and shall remain enlightened from sunset to sunrise.

The Project Manager's Representative may direct placement of additional warning lights at other locations for the safety and proper flow of traffic.

1.5 Flagmen

Flagmen shall be provided with two hand signs at all times, the hand signs shall be of paddle type, 30 cm in diameter; one painted STOP / GO and the other painted SLOW. Flagmen shall be posted at the beginning and end of the restricted section and at intervals of 500 meters within the restricted section. The contractor shall install signs, lights, barricades and furnish flagmen as specified above or as directed by the Project Manager's Representative and shall maintain all such devices in good working conditions. The contractor shall be fully responsible for the public safety for the full duration of the contract period. The Contractor shall use every precaution possible to safeguard the person and the property of the travelling public and to divert traffic from the road on which the work is in progress. Failure of the Project Manager's Representative to notify the Contractor to maintain barrier, lights, signals or watchmen shall not relieve the contractor from his responsibility.

1.6 Payment

No payment for such detours, temporary structures and maintenance thereof and for the provision, maintenance and operation of Traffic Control Devices, shall be made to the contractor and the costs shall be deemed to be included in the price of relevant items of pavement construction in the Bill of Quantities. The Project Manager's Representative reserves the right to have detours constructed and maintained at the risk and cost of the Contractor if he fails to do this work as required.

SP-2 FACILITIES BY THE EMPLOYER

2.1 Additional Land Areas

All the land required for the construction of the road shall be provided by the Employer as warranted in the clauses of agreement. If the contractor requires additional land other than for the construction purpose of the road, for any purpose for the project other than made available to him, it shall be his sole responsibility and at his own expense to procure, rent or lease such additional land. The cost of procuring renting, leasing or payment of royalties connected with extracting or processing the materials shall be borne by the contractor and shall be considered to be included in the unit price of various items of works.



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SP-3 SUPPLY AND INSTALLATION OF TRAFFIC ROAD SIGNS

Notwithstanding the provision of General Specification the traffic road signs shall also meet the specifications for manufacturing and installation as given in the "Manual of Uniform Traffic Control Devices. **Ministry of Communications, Highway Safety Wing, Government of Pakistan, 1989**".

The work shall be measured and paid for as per unit prices given in the Bill of Quantities which shall be full compensation for all labour, material, equipment, etc.

SP-4 DISMANTLING OF STRUCTURES

Notwithstanding the provisions of Item 510 of the General Specifications, Stone / Bricks available from dismantling of existing structures shall be re-used and necessary deductions from relevant item of work of New Masonry Structures shall be made in accordance with rate analysis.

SP-5 SUPPLY OF BITUMEN AND CEMENT, ETC.

The Contractor shall arrange and ensure timely supply of Bitumen, Cement and other materials required in the Work. The Employer does not assume any responsibility for the supply of materials. However, the Employer shall issue a certificate of the estimated requirement of the quantity of Bitumen and Cement at the specific request of the Contractor.

SP-6 ELECTRIC SUPPLY

The Contractor shall make arrangement for the electric power supply and distribution of the same at the Site of Works for the completion of the Works at his own expense.

SP-7 BORROW AREAS

The Contractor shall make his survey / enquiries regarding the suitable and nearest Borrow Areas for embankment, granular fill, base and sub-base materials etc., and shall apply to the Project Manager for approval for the use of the borrow area. It will be the responsibility of the Contractor to acquire the Borrow Areas approved by the Project Manager and pay for all royalties / malkana and all other costs. In case the materials from the approved Borrow Areas do not meet the Specifications, in the opinion of the Project Manager and Engineer's Representative, the Contractor shall have to propose new Borrow Areas for approval, and nothing shall be paid to the Contractor for abandonment of the previously approved Borrow Areas. Additional information regarding borrow and quarry sites shall be made available to the Project Manager and Engineer's Representative.

SP-8 PERSONAL LIABILITY OF PUBLIC OFFICIALS

In carrying out any of the provisions of these Specifications, or in exercising any power of authority granted to them by or within the scope of the Contract, there shall be no liability upon the Employer or his authorized representatives either personally or as officials of the Government, it being understood that in all matters they act solely as agents and representatives of the Government.



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No member or officer of the Government or the Employer or the Employer's Representative or any one of their respective staffs or their employees shall be in any way personally bound or liable for the acts or obligations of the Employer under the Contract or answerable for any default or omission in the observance or performance of any of the acts, matters or things which are herein, contained.

SP-9 ACCESS AND CANAL ROADS

If the Contractor finds it necessary or elects to use existing canal roads, the Contractor shall make all necessary arrangements and obtain all permits from the provincial Irrigation Department for travel over and use of such canal roads. The Contractor shall observe all rules regulations of the Irrigation Department regarding the use of said canal roads. The cost of maintaining all necessary safety measures and temporary structures and making any necessary repairs, replacements or similar operations and all or any other costs required by reasons of his use of such canal roads shall be borne by the Contractor and the Contractor shall save harmless and indemnify the Employer in respect of all claims, demands, proceedings, damages, costs, charges and expenses whatsoever arising out of or in relation to any such operation or interference.

SP-10 IRRIGATION FLOW

The Contractor shall conduct his operations so as to offer the least possible obstruction for maintaining flow in irrigation canals, channels and water courses. The Contractor shall observe all rules and regulations of appropriate authorities regarding the interruption and maintenance of flow in irrigation canals, channels and water sources and the Contractor shall save harmless and indemnify the Employer in respect of all claims, demands, proceedings, damages, costs and expenses whatsoever arising out of or in relation to any such construction, operations or interferences with irrigation flows.

The Contractor shall maintain alternate channels wherever temporary relocation of irrigation channels is required or where his operations disrupt the irrigation flow, without any compensation from the Employer.

SP-11 UTILITY LINES

The Contractor shall conduct his operations, make necessary arrangements, take suitable precautions and perform all required work incident to the protection of and avoidance of interference with power transmission, telegraph, telephone and natural gas lines, oil lines water and sewerage mains and other utilities within the areas of his operations in connection with this Contract and the cost thereof shall be borne by the Contractor and the Contractor shall save harmless and indemnify the Employer in respect of all claims, demands, proceedings, costs, charges and expenses whatsoever arising out of or in relation to any such interference.

SP-12 FIRST AID FACILITIES



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The Contractor shall provide and maintain adequate First Aid Facilities convenient to the Site to the approval of the Employer.

SP-13 LOCATION OF CONTRACTOR'S CAMP

The location of houses, barracks, stores and offices, etc., shall be determined in agreement with Employer. Installation for the supply of electricity and water, fuel, lighting, etc., must be present to the necessary extent.

SP-14 MAKING GOOD DAMAGE TO SERVICES, EARTHWORK, ETC.

The Contractor shall make good, at his own cost, all damages to telephone, telegraph and electric cables or wires, sewers, water or other pipes and protective works and retaining structures, except where the Authority, Employer or Private Party owning or responsible for the same elects to make good the damage.


All injuries to the surface of the land, to the beds of water courses, protecting banks, riverbeds, etc. where disturbed by the works (other than where specifically ordered by the Employer), shall be repaired by the Contractor or the Authorities concerned, at the Contractor's expense. All such making good shall be to the approval of the Employer.

SP-15 RETURNS OF PLANT, MATERIALS, ETC.

The Contractor shall forward to the Employer at the end of each month returns showing the Constructional Plant, materials, etc., on Site, in a form prescribed by the Employer.

SP-16 METHOD OF MEASUREMENT

The measurement of the Work shall be performed on the basis of the Specifications. If these measurements exceed the measurements indicated in the Specifications and Drawings, excepting those directed by the Employer, such excess shall be on the account of the Contractor and he shall not be entitled to any compensation therefor. But if they are less than the measurements indicated in the Specifications and Drawings then the Works actually executed shall be measured, provided they are technically acceptable and there is no provision to the contrary in any other part of the Contract Documents. All work completed under the Contract shall be measured according to the metric system for all items, unless otherwise provided herein or in the special Provisions. All longitudinal measurements for area or volume will be made horizontally along the road centre line, and no deduction will be made for individual fixtures in the pavement having an area of 1 sq. Meter or less. All transverse measurements for area or volume of pavement courses will be made horizontally in accordance with the dimensions indicated on the plans, or the dimensions ordered by the Employer. In computing volume of excavation, embankment and borrow, the average end-area method will be used.



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Quantities of materials wasted or disposed off in a manner not called for under the Contract or rejected loads of materials, including material rejected after it has been placed by reason of the failure of the contractor to conform to the provisions of the Contract, or material not unloaded from the transporting vehicle, or material placed outside of the lines indicated on the drawings or established by the Employer, or material remaining on hand after completion of the work will not be paid for and such material should be disposed off by the Contractor at his own expense. No compensation will be allowed for hauling rejected materials. The Works shall be measured net notwithstanding any general or local custom except where otherwise specifically described or prescribed in the Contract.

SP-17 RECORD OF MEASUREMENTS

The Contractor will supply to the Employer's Representative six (6) copies of the abstract of Contractor's certificate of payment every month along with two copies of detailed measurements, quality control tests and cross sections with calculations, and any other document or information which form the basis of payment.

SP-18 DANGEROUS MATERIALS

The Contractor and his sub Contractors shall convey, store and make use of all explosives, dangerous petroleum, acetylene, carbide of calcium and other similar material provided by them for use in or on the works in strict accordance with the provision of all laws, orders and regulations that are in force at the Site or may be issued from time to time by the Government.

Table of Contents for Special Items of Works (SIW)

Item No.	Description	Page No.
SIW-1	Temporary Road Works For Traffic Diversion	
SIW-2	3.2 Definitions - General Specifications	
SIW-3	Requirement For Asphalt Cement	
SIW-4	Precast Prestressed/Post tensioned Concrete Girder	
SIW-5	Galvanized Iron Drain Pipe 75 mm diameter	
SIW-6	PVC pipes, Sch. 40 200 mm diameter or services	
SIW-7	Exploratory/Confirmatory Boring and Soil testing, including soil investigation reports	
SIW-8	Formation of shoulder with permeable material	
SIW-9	Water Bound Macadam	
SIW-10	Structural Excavation and Backfill	
SIW-11	Grooving of Existing Road Pavement of Size 4X4 CM @ 2 M C/C	
SIW-12	Assemblies Expansion Joints	

Handwritten signature and official stamp of the Provincial Road Improvement Project, C&W Department Peshawar.

SIW-13	Providing and filling sand behind abutment	
SIW-14	Grouted Stone Pitching	
SIW-15	Premoulded joint filler	
SIW-16	Plum Concrete	
SIW-17	Steel Wire Mesh for Gabion	
SIW-18	Vehicles for Construction Supervision Consultants	

PART III - METHOD OF MEASUREMENT FOR SPECIAL ITEM OF WORKS

INTRODUCTION

The special instructions of work are specified to the project and to be read and interpreted in conjunction with other construction contract documents and are part of contract document. In case of any variation with the **items/sub-items** of works of General Specifications, provision of special provisions shall prevail.

SIW-1 Item 705 Temporary Road Works For Traffic Diversion

Delete the 7.5.2 and add the following:

Measurement and Payment

No measurement shall be made for providing, maintaining, removal and disposal of temporary road works for diversion of traffic. The costs of the work involved as specified herein shall be deemed to be included in other pay items of Bill of Quantities.

In case the Contractor fails to maintain the traffic with a reasonable smooth and dust free riding surface, to the satisfaction of the Project Manager, the Project Manager may so certify in writing to the Employer and the Employer may thereupon employ any other person(s) to carry out the same and recover all expenses consequent and incidental thereto from the Contractor without voiding the Contract or releasing the Contractor from any of his obligations or liabilities under the Contract or affecting the rights and powers conferred on the Employer or the Project Manager by the Contract.

Add to Item 705 the following:

The Contractor shall conduct his operations so as to offer the least possible obstruction and inconvenience to the public. The riding surface of detours and temporary road works shall be maintained smooth and dense by regular grading, sprinkling and rolling operations. Traffic shall not be permitted on to any portion of the Works unless expressly permitted by the Project Manager in writing.

SIW-2 2.2 Definitions - General Specifications

In item 3.2 of General Specifications, Definitions, add:

Page G-10 Replace definition of Boulder with the following new definition:

"A hard durable stone or rock fragment, usually rounded by weathering or abrasion, with an average dimension of 15 cm or more, but not less than 15cm in shorter side".



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SIW-3 Requirement for Asphalt Cement

Add the limits for the "Softening point" in Table as follow:

	40 – 50		60 – 70		80 – 100	
	Min	Max	Min	Max	Min	Max
Softening Point C	47	58	44	54	41	51

SIW 4 Item 405 Precast Prestressed/Post tensioned Concrete Girder

4.1 Description

This work shall consist of pre-stressing/post tensioning precast or cast-in-place concrete members of super structure of bridge including girder, diaphragm, deck slab etc. by furnishing, placing and tensioning steel in accordance with details shown on the drawings and specified in item 405 of the general specifications or as directed by the Project Manager.

4.2 Measurement and Payment

Pre-stressed Concrete Girders

Measurement and payment of pre-cast, pre-stressed girders as mentioned in Clause 405.1 of General Specifications shall include supply, haulage, assembling, installation pre-stressing anchorages, pre-stressing steel, sheath, stressing of cables with jacks, injection of cement grout in cables, cutting of projecting ends, making good anchorage recesses with concrete, handling and all other items required for completion of job as per pay item SIW-4 Payment for Concrete Class D and steel reinforcement Grade 60 shall be made in accordance with General Specifications Items 401d and 404b respectively.

Launching of Girders

Launching of girders shall be carried out in the field as directed by the Project Manager. Cost for items shall include launching of the Girders in place including lifting and handling any number of times including temporary works and all other items required for completion of launching of girders.

Pay Item No.	Description	Unit of Measurement
A.		
SIW 4a Item 405	Pre- stressing High tensile Steel including sheathing, anchorages assemblies, grouting And stressing complete in all respect.	Kg
SIW 4b Item 405	Launching of Girders in place including lifting & handling including temporary works ----- m long.	Ton

SIW 5 Galvanized Iron Drain Pipe

5.1 Scope

The Contractor shall furnish and place galvanized iron drain pipe (AASHTO Standards M1118-80 (1986) in accordance with the plan of Bridge deck, specifications and or as ordered by the Project Manager.

5.2 Materials

The Galvanized Iron pipe shall conform to the requirements of ASTM Designation A120.

5.3 Construction

Where the pipe is used for bridge drains it shall be cast in the deck and top cut flush with the deck surface.

5.4 Measurement

The quantity to be paid for under this item will be the number of pipes incorporated in the work in accordance with the plans and specifications and as directed by the Project Manager.

5.5 Payment

The unit price bid per number shall include the cost of furnishing all labour, materials and equipment necessary to complete the work.

Pay Item No.	Description	Unit of Measurement
SIW 5	Galvanized iron drainpipe, 75 mm diameter.	No.

SIW 6 PVC Pipes For Service

6.1 Scope

The Contractor shall furnish and place PVC pipes in accordance with the plan of Bridge deck, specifications and or as ordered by the Project Manager.

6.2 Materials

The PVC pipe shall conform to the requirements of ASTM Standard D 1785-03 Schedule 40.

6.3 Construction

Where the pipe is used for services, it shall be laid under the walkway as shown on the drawings or as directed by the Project Manager.

6.4 Measurement



The quantity to be paid for under this item will be the net overall length of pipes and fittings as fixed in accordance with the plans and specifications and as directed by the Project Manager.

6.5 Payment

The unit price bid per linear meter shall include the cost of furnishing all labour, materials and equipment necessary to complete the work.

Pay Item No.	Description	Unit of Measurement
SIW 6	PVC pipes, Sch. 40 200 mm diameter for services	M

SIW 7 Item 407 EXPLORATORY/CONFIRMATORY BORING, SAMPLING AND TESTING

7.1 BORING, SAMPLING AND TESTING

7.1.1 Description

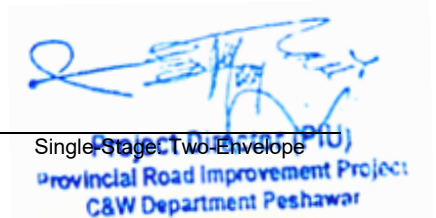
Exploratory/confirmatory boring and tests may be required at the sites of proposed bridge structures or at any other location as directed by the Project Manager. The works to be executed comprise of drilling/boring for bridge/road sub-soil Investigation, laboratory testing of retrieved samples, and interpretation of results and submission of report.

The number of boreholes required would be as directed by the Project Manager. The borings shall extend to a depth of at least five (5) meters below the pile tip elevation at bridge sites as indicated in the drawings and minimum of 10 meters at other locations as directed by the Project Manager.

Sub-surface conditions shall be investigated by straight rotary borings as specified below:

- Length of each borehole: as directed by the Project Manager.
- Standard penetration tests at every 1.0m interval.
- Extraction of undisturbed samples in cohesive strata.
- Collection of disturbed samples.
- Disturbed and undisturbed soil samples taken by split deniser/pitcher/Shelby tube to be tested as directed by the Project Manager. The tests could include one or more of the following tests on selected soil samples:

- 1) Natural Moisture Content, Density & Specific Gravity
- 2) Grain Size Analyses
- 3) Atterberg limits
- 4) Undrained triaxial tests



- 5) Unconfined compression strength tests
- 6) Consolidation tests
- 7) Direct shear box tests
- 8) Natural moisture and unit weight
- 9) Soluble sulphate content in soil/water

7.1.2 Equipment and Method

a) Equipment

The boring, drilling, excavating sampling and testing equipment selected by the Contractor shall be such as to be most suited to the subsurface strata likely to be encountered, to enable an accurate determination of strata changes and obtain samples with minimum sample disturbance.

b) Drilling Method

Drilling shall be by straight rotary drilling using casing or wash basing technique.

7.1.3 Field Testing and Sampling

The Standard Penetration Tests (SPT) shall comply with ASTM D 1586. SPT's shall be carried out in the borehole at every 1.0 m interval and at changes of strata.

a) Undisturbed Samples

The undisturbed samples shall be taken in cohesive soils from the boreholes at the depths designated by the Project Manager during the execution of work. The procedure shall conform to ASTM-D 1587

b) Disturbed Sample

Small disturbed sample shall be taken from the cutting shoe of thin wall tube sampler and from split spoon samples.

c) Ground Water Observations

Ground water when encountered shall be recorded in all boreholes. All unusual water conditions and elevations at which such conditions are encountered shall be carefully observed and recorded by the Contractor.

d) Log of Boreholes

A continuous log of each borehole shall be completed by the Contractor in the field and shall be submitted in duplicate to the Project Manager within two

days after each borehole is completed. The format of all logs shall be in accordance with ASTM D2488 – 84, standard practice for description and identification of soils (visual – manual procedure), subject to the approval of the Project Manager.

7.1.4 Laboratory Testing.

Laboratory testing should be conducted to determine the relevant engineering properties and identify the most severe design criteria. Types of tests required shall be as given in article 7.1.1 above. Frequency of tests shall be as approved by the Project Manager.

7.1.5 Geo-technical Report

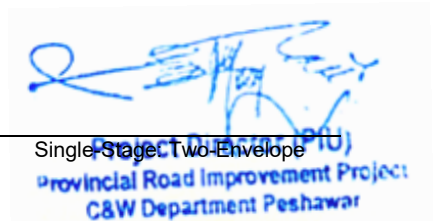
The report shall include, but will not be limited to:

- i) A layout plan showing the actual location of boreholes.
- ii) General information about the site, including a description of general subsoil conditions and the subsurface strata encountered.
- iii) Logs of boreholes.
- iv) Results of Field and Laboratory tests, observations and analysis.
- v) Recommendation on type of support (i.e., pile or footing foundation).
- vi) Allowable loading and bearing capacities.
- vii) Settlement considerations.
- viii) Corrosion effect of soil and water encountered in the boreholes.

7.1.6 MEASUREMENT AND PAYMENT

The measurement and payment for the work specified above for drilling of boreholes including collection of disturbed, undisturbed and rock core samples, performing the field and laboratory testing and compilation and presentation of reports shall be done and paid against Provisional Sum given in the BOQ.

Pay Item No.	Description	Unit of Measurement
SIW –7 a	Exploratory/Confirmatory Boring	M
SIW – 7 b	Soil testing, / investigation report	L. Sum
SIW 8	Formation of shoulder with permeable material Passing less than 7 % from 200 seive and P.I less than 4 as specified.	
8.1	Description	



This work shall consist of placing a 15 cm layer of permeable material as required by the drawings and in accordance with the specifications and in conformity with the lines, grades and typical cross-sections shown on the plans or established by the Project Manager. The layer shall be compacted to at least 95% maximum dry density as determined by AASHTO T-180 method B or D whichever is applicable

8.2 Material Requirements

Material for "Formation of shoulder with permeable material passing less than 7 % from 200 sieve and P.I less than 4 as specified according to Drawing as per Engineer Instructions" shall consist suitable material of permeable material from quarry. The material should follow the following gradation:

<u>Sieve Size</u>	<u>Percentage Passing</u>
75mm	100
19mm	80-100
No.4	60-80
No.40	40-60
No.100	0-15
No.200	0-5

The material under this item shall conform to the following Specification.

CBR of the material shall not be less than Fifty (50) percent, determined in accordance with AASHTO T-193. CBR value shall be obtained at a density corresponding to ninety five percent (95%) of the Maximum Dry Density determined from AASHTO T180-93.

Swell value of the material for embankment formation shall not exceed three tenth (0.3) percent. In case sandy material be used for embankment formation, it shall be properly confined with a material approved by the Project Manager and shall not be used on slopes of embankment.

Plasticity Index should not be more than 4%.

The grading of the material should be such that the intrusion of fines into the Crush Stone Layer from the crush material just under it or from natural ground surface is avoided. For this condition to be met, it will be required that the ratio

- i) $D_{15} \text{ filter} / D_{15} \text{ soil} \geq 5$
- ii) $D_{15} \text{ filter} > 0.074 \text{ mm (+sieve\#200)}$
- iii) $(D_{60} / D_{10}) \text{ filter} \leq 20$

D15 and D60 mean the particle diameters corresponding 60% and 15% respectively, passing (by weight) in a grain size analysis.

8.3 Construction Requirements

The Crush Stone Layer may be used in Waterlogged area for Filtration purpose.

8.4 Measurement and Payment



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8.4.1 Measurement

Measurement shall be the same as 108.4.1 of the General Specifications.

8.4.2 Payment

The quantity to be paid for shall be the number of cubic meters placed as crush stone layer, payment will be deemed to include taxes of local, Provincial and Federal Government, cost of hauling all lead and lift, spreading watering, rolling, labour, equipment tools and incidental necessary to complete this item.

Pay Item No.	Description	Unit of Measurement
SIW 8	Formation of shoulder with permeable material Passing less than 7 % from 200 sieve and P.I less than 4 as specified.	CM

SIW-9 Item 206 Water Bound Macadam

206.3.3 Add the following text after the last line of para six (6)

Water Bound Macadam has been proposed in this project as a stiff base layer. There is, as such, no compaction procedure available in the NHA Specifications. For determination of percentage of field compaction for Water Bound Macadam any one of the following two alternatives shall be adopted as directed by the Project Manager¹.

Alternative I:

Lab. Density

As per general practice the WBM consists of stone and filler in the ratio of 70-80% of stones and 20-30% of filler (Stone Dust). It is suggested that a sufficient quantity of WBM Aggregate shall be sampled from site and mixed with filler (stone dust) in the ratio of 75:25. The bulk sample thus prepared may be sieved on 3/4" sieve and material retained on 3/4" sieve discarded. The residual sample shall be used to determine M.D.D. as per AASHTO T180. Alternatively, the Project Manager may allow sampling from a representative compacted reach for obtaining sample and subsequent determination of Lab. M.D.D.

Field Density

The field density test may be carried out in accordance with AASHTO T-191, with the following modification i.e. the material retained on 2" sieve shall be returned to the test pit before start of sand pouring. The adjusted M.D.D. shall be determined as per AASHTO T224 based on:

¹Courtesy of National Highway Authority, Design Wing



- i) M.D.D. (T-180)
- ii) % of +3/4" material up to 2"
- iii) Specific gravity of +3/4" material

Alternately, the following equation may be used:

$$D = \frac{1000}{\frac{P_c + 1000 \times P_f}{G_m \times r \times D_f}}$$

Where,

- D_f = M.D.D. of -3/4" Material (kg/m³)
- D = Adjusted MDD (kg/m³)
- P_c = % of coarse particles expressed as a fraction
- P_f = % of fine particles expressed as a fraction
- r = Bulk specific gravity of particles retained on 3/4" sieve Coefficient as below

r	P _c
1.00	: 0.2 or less
0.99	: 0.21 – 0.25
0.98	: 0.26 – 0.30
0.97	: 0.31 – 0.35
0.96	: 0.36 – 0.40
0.95	: 0.41 – 0.45
0.94	: 0.46 – 0.50
0.92	: 0.51 – 0.55
0.89	: 0.56 – 0.60
0.86	: 0.61 – 0.65
0.83	: 0.66 – 0.70

In case it is not feasible to return +2" material in the hole the volume of +2" material may be determined based on its specific gravity and the same deducted from gross volume of test pit hole to determine wet field density as under:

$$RWET = \frac{(Wt \text{ of material excavated} - Wt \text{ of } +2" \text{ material})}{(\text{Vol. of hole} - \text{vol. of } +2" \text{ material})}$$

Subsequently dry density may be determined and compared with Adjusted M.D.D. to determine % compaction.



Alternative 2:

This alternative is based on replacement method as per AASHTO T -180 for lab. Proctor and subsequent site adjustment for coarse aggregate as per AASHTO T -224.

Lab. Density


Sufficient bulk sample for WBM Base Course may be obtained from site after rolling/mixing and processed in lab. as follows:

- a) The filed sample should be sieved on 2" sieve and +2" material discarded.
- b) The remaining sample should be sieved on 3/4" sieve and percentage of +3/4" & -3/4" material noted.
- c) Plus 3/4" material should be removed and minus 3/4" material divided in two parts by quartering.
- d) The proctor sample may be prepared as under:
 - i) Total sample required = Z gm (say)
 - ii) % of -3/4" material (As per step b) = 40% (say)
 - iii) % of +3/4" material (As per step b) = 60% (say)
 - iv) Obtain 40% material from Part I i.e. $Z \times 0.4 = X$ gill.
 - v) Obtain 60% material from Part IT i.e. $Z \times 0.6 = Y$ gill. (Material portion retained on #4 sieve)
- e) The percentage of +#4 material should be noted in the composite Proctor sample ($Z = X + Y$) and M.D.D. determined as usual.

Field Density

The material obtained from the test pit should be sieved on 2" sieve and plus 2" material separated for subsequent treatment/adjustment of F.D.T. as explained in Alternative. The minus 2" material should be sieved on #4 sieve to determine the percentage of +#4 material and compared with reference value of +#4. Material noted earlier in lab. Proctor sample. In case of any difference the lab. Density may be adjusted on lower higher side, as the case may be, based on Figure 2 of AASHTO T -224.

In order to minimize the effect of aggregate loosening on the periphery of 6" dia test pit resulting in lower density it is strongly recommended to use minimum 8" dia and preferably 12" dia sand cone apparatus.



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Payment of all these laboratory tests is deemed to be included in the cost for the item of the work.

SIW 10 ITEM 107 STRUCTURAL EXCAVATION AND BACKFILL

107.3 CONSTRUCTION REQUIREMENTS

107.3.3 BACKFILL

Delete the paragraph (h) of NHA's General Specification 1998 and substitute as under :

No backfill shall be placed against any concrete or masonry structure until permission shall have been given by the Project Manager and preferably not until the concrete or masonry structure has been in place fourteen (14) days, or until test cylinders show the strength to be twice the working stress used in the design. The backfilling shall be carried out on both sides of the structure simultaneously.

Add paragraph (i) as follows :

Any temporary backfill or platform constructed by the Contractor for piling purposes or for any other work items shall be built and subsequently removed by the Contractor without payment as directed by Engineer.

SIW-11 GROOVING IN EXISTING ROAD OF SIZE 4X4 CM @ 2 M C/C

11.1 DESCRIPTION

This item shall consist of grooving of existing road surface to ensure bondage of new layer with the existing road pavement and to ensure drainage of water below the surface of freshly laid pavement structure. The surface on which the embankment/ pavement structure is to be constructed shall be approved and accepted by the Project Manager prior to placing the embankment/ pavement structure.

11.2 CONSTRUCTION REQUIREMENTS

The method of grooving of road surface shall be proposed by the Contractor and approved by the Project Manager, in accordance with the requirements under site conditions.

After the existing pavement structure has been grooved off, the material shall be removed and disposed of outside the right of way, according to the satisfaction of the Project Manager.

11.3 MEASUREMENT AND PAYMENT

11.3.1 Measurement



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The quantity for road pavement structure grooved and removed, to be paid for shall be measurement in square meter to a depth as shown in the item (4cm x 4cm) and in the area earmarked by the Project Manager for such purpose.

11.3.2 Payment

The accepted quantities measured as provided above shall be paid for at the Contract unit price respectively for the pay items listed below and shown in the Bill of Quantities, which price and payment shall constitute full compensation for carrying out the works mentioned above including cost of labor, equipment, disposal as directed by the Project Manager, tools and incidental necessary to complete the work prescribed in this item:

Pay Item No.	Description	Unit of Measurement
SIW - 11	Grooving of Existing Road Pavement	SM

SIW-12 Item 406 c **SUPPLY AND PLACE IN POSITION EXPANSION JOINT ASSEMBLIES AS SPECIFIED & AS PER APPROVED DRAWING**

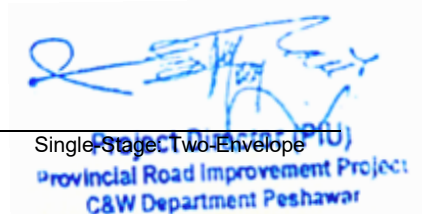
12.1 DESCRIPTION

Expansion joints will follow Specification of AASHTO-SS-Division II – section 19 “Bridge deck joint seals”.

The contractor shall submit to the Project Manager, complete documentation about the Expansion joints Freyssinet Cipec (WOSd 50) or equivalent intended to be used for the movements shown on the drawings, including references of the last 10 years, material specifications for metal, rubber and bonding between them, fixations and test certificates from authorized laboratories showing that the proposed joints meet the specifications. The submittal will be accompanied by samples of at least 0.50 m, with its fixations.

The expansion joints shall satisfy the following functional requirements:

1. It shall withstand traffic loads of the highway, and accommodate movements between the deck and abutment or the adjacent deck.
2. It shall have good riding quality and shall not cause any inconvenience to road user.
3. It will not cause skidding hazard.
4. It will not generate excessive noise or vibration during the passage of vehicles.
5. Parts liable to wear out shall be easily replaceable.
6. It will be watertight and will have provision for carrying away water and silt.
7. It will be easy to inspect and maintain.
8. It will be resistant in hot and very sunny climate.



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12.2 Construction Requirements

The methodology of placing the expansion joint will be clearly described by the contractor with a complete set of drawings.

Connection or overlapping between roadway and walkway expansion joints will be clearly shown.

Connection with water proofing of the deck will be detailed.

All necessary provisions in deck reinforcement will be indicated.

Initial gap at the time of placing will be clearly indicated and justified.

The second stage reinforced concrete for fixations, if any, will be Class Y concrete and will be included in the pay item.

12.3 Measurement and Payment

12.3.1 Measurement

The length of computed joints for roadway is measured in linear metre.

12.3.2 Payment

The accepted quantity measured as provided above shall be paid for at the contract unite price respectively for the pay items listed below and shown in the bill of quantities which price and payment shall be full compensation for furnishing all materials, labour, equipment, tools and incidental and any work pertaining to expansion joints and which is not paid for separately, necessary to complete the item.

Pay Item No.	Description	Unit of Measurement
SIW - 12	Supply and place in position expansion joint assemblies as specified & as per approved drawing	M

ITEM SIW-13 Providing and filling sand behind abutment of Causeways, Culverts and Bridges.

DESCRIPTION

This item shall consist of leveling, dressing, and saturation of sand material behind of culverts, bridges and causeways abutments. River bed sand free from organic material shall be used to achieve the desired compaction to finished backfilling. The backfilling which is constructed with sand shall be approved and accepted by the Project Manager prior to placing the pavement structure.

13.2 CONSTRUCTION REQUIREMENTS

The method of layer wise (30 cm each layer) sand filling will be fully saturated with water. River bed sand shall be proposed by the Contractor and approved by the Project Manager as per relevant lab tests in accordance with the requirements under site conditions.



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13.3 MATERIAL REQUIREMENTS

River bed sand Material shall be used.

13.4 MEASUREMENT AND PAYMENT

13.4.1 Measurement

The work described above to be paid for shall be measured in cubic meter as shown on the Drawings/cross-sections or as specified, earmarked by the Project Manager for such purpose.

13.4.2 Payment

The accepted quantities measured as provided above shall be paid for at the Contract unit price respectively for the pay items listed below and shown in the Bill of Quantities, which price and payment shall constitute full compensation for carrying out the works mentioned above.

Pay Item No.	Description	Unit of Measurement
SIW 13	Providing and filling sand behind abutment of Causeways, Culverts and Bridges.	CM

SIW -14 Item 511 Stone Pitching

511.4.2 Payment Add the following:

Pay Item No.	Description	Unit of Measurement
SIW 14 b Item 511	Grouted Stone Pitching	CM

SIW -15 Item 406a Premoulded Joint Filler 20 mm Thick with Bitumastic joint seal

406.4.2 Payment Add the following:

Pay Item No.	Description	Unit of Measurement
SIW 15 Item 406a	Premoulded Joint Filler 20 mm Thick	M

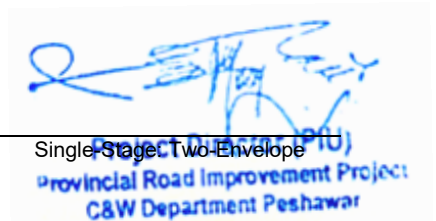
SIW 16 Plum Concrete

This work shall consist of construction of Retaining Walls etc. of Plum Concrete comprising 50% Concrete Class B and 50% Rock/ Boulder Fill Material or Plum Concrete comprising 60% Concrete Class B and 40% Rock/ Boulder Fill Material.

16.1 Requirement

Plum Concrete shall be comprise 50% or 60% Concrete Class B (NHA General Specification 1998) and 50% or 40% Rock/ Boulder Fill having stone size ranging between 100 mm- 200 mm in size.

16.2 Measurement



The quantity to be paid for shall be the number of cubic meters of concrete and rock fill complete in place and accepted.

In measuring the volume to be paid for, the dimension to be applied shall be those shown on the drawings except where others ordered by the Project Manager in writing.

Deduction from the theoretical volume shall be made for the volumes of draining hole, weep holes, pipes and conduits, etc., in case where their cross-sectional areas exceed 500 square centimetres.

16.3 Payment

The accepted quantity measured as provided above shall be paid for at the contract unit price respectively for the pay items listed below that as per shown in Bill of Quantities which prices and payment shall be full compensation also for such works as formwork, curing, surface finishing and/or rendering as required, formation of construction joints and any such work and incidentals necessary to complete the item.

For all plum concrete structures or portions, thereof, no separate measurement or payment shall be made or false work, centering, formwork or any other temporary work to complete the plum concrete structure or portion thereof, payment for all such temporary work shall be deemed to be included in this contract price.

Pay Item No	Description	Unit of Measurement
SIW-8	Plum Concrete (Class 'B' with 50% or 40% Rock/ Boulder) as per drawing & Engineer's Instructions	CM

SIW -17 Item 507 a Steel Wire Mesh for Gabion

507.4.2 Payment Add the following:

Pay Item No.	Description	Unit of Measurement
SIW 17 Item 507 a	Steel Wire Mesh for Gabion	SM

SIW-18 VEHICLES FOR CONSTRUCTION SUPERVISION CONSULTANTS

A GENERAL

On the instruction of the Project Manager the Contractor shall provide and make available at all times the following new vehicles for the exclusive use by the Project Manager and his staff at their designated offices for project supervision and other project purposes

- Toyota Pickup Double Cabin (REVO) or Equivalent, new and latest model: 02 Nos. [each by the contractors of the two (02) Lots (*Lot-1, and Lot-2*)]. Air Conditioned and fully equipped as per manufacturer's specifications (For Construction Supervision Consultants)

The Contractor shall provide safe, experienced, and competent drivers with the approval of the Project Manager for the above vehicles. Each Driver shall be responsible for the vehicle allocated to him for the duration of the entire duration of the Contract, and any extended period and for any period of delay attributable to the Contractor. The Contractor

shall promptly replace any driver who, in the Project Manager's opinion, is not performing satisfactorily.

The Contractor shall provide vehicle within 15 days of receipt of such Engineer's instruction. In case of failure to provide any or all of the said vehicles within the prescribed period of time, the Contractor will pay penalty to the Employer at a rate equivalent to the per day rental of the vehicles required to be provided during that specific period for which the Contractor fails to provide the vehicle(s).

B MAINTENANCE OF VEHICLES:

All the Vehicles shall be registered, taxed, comprehensively insured, fueled, repaired, serviced, and maintained by the Contractor, for the duration of the Contact and for any extended period under the Contract and for any period of delay attributable to the Contractor, in the following manner:


- If a vehicle is not in a road worthy condition, the Contractor shall provide the Project Manager a temporary replacement of the vehicle, until that vehicle is repaired and returned for use.
- Maintaining, cleaning, repairing, and servicing the vehicle(s) according to manufacturer's recommendations and garaging, replacing the tyres, batteries, parts etc. whenever necessary and directed by the Project Manager.
- Supply necessary POL etc.
- Procuring and maintaining the validity of vehicle insurance policies and registration. Comprehensive insurance policy including theft, fire (covering a qualified driver authorized by the Project Manager together with authorized passenger's liability cover) shall also be the responsibility of the Contractor. The policies, license and registration shall be valid till the end of the project.

If the Contractor fails to maintain any or all of the vehicle(s) to the satisfaction of the Project Manager or otherwise fails to comply fully with this section, the Employer upon the Project Manager's recommendation may do so by himself and the Project Manager may withhold an amount which the Employer incurs in order to fulfil the liabilities which Contractor failed to comply with under this section plus the Employer's overheads incurred in doing so, all in accordance with sub clause of Contract. The Contractor shall bear all costs that may arise including delays due to failure of the Contractor to comply with this section.

C OWNERSHIP OF VEHICLES AFTER COMPLETION:

The vehicles shall remain the property of the Contractor on the completion of the works. The cost of new vehicles including all POL, taxes, comprehensive insurances and renewal of the same as and when required also vehicle registration and the renewal of the same as and when required, ensuring that both registration and comprehensive insurances remain duly valid till the end of the project which is the day of issuance of the Performance Certificate under sub clauses of the Contract, shall not be payable to the Contractor separately, but shall be deemed to have been included in his bid cost under other items.

D MEASUREMENT AND PAYMENT:



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The cost of vehicles, cost of fueling, maintaining, repairing, replacing parts, and servicing the Vehicle as and when required and or scheduled, shall not be payable separately to the Contractor but shall be deemed to have been included in his bid cost.

Pay Item No	Description	Unit of Measurement
SS-18 (a)	Provide new Vehicles, REVO 02 Nos. Double Cabin or Equivalent AC fitted fully equipped as per Manufacturer's Specifications at TL Office / RE's field office at <i>[Peshawar, and Chitral]</i> with all comprehensive insurances, taxes, registrations and renewal of the same including driver. <i>[each by the contractors of the 02 Lots (Lot-1, and Lot-2)]</i>	Not Payable
SS-18 (b)	POL, Maintenance, repairs, replacement parts, servicing etc of vehicles under item SS 18 (a) <i>[each by the contractors of the 02 Lots (Lot-1, and Lot-2)]</i>	Not Payable



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SUPPLEMENTARY SPECIFICATIONS

SS-1	Electric Supply Rates and Prices Inclusive
SS-2	Rates and Prices Inclusive
SS-3	Provision of Plant
SS-4	Rates inclusive of Lead and Lift
SS-5	Document not to be Altered or Mutilated
SS-6	Final Hand-Over
SS-7	Return of Plant, Materials, etc.
SS-8	As Built Drawings/Shop Drawings
SS-9	Safety Precautions
SS-10	Income Tax

SUPPLEMENTRY SPECIFICATIONS

SS-1 Electric Supply Rates and Prices Inclusive

The Contractor shall make arrangement for the electric power supply and distribution of the same at the site of Works for the completion of the Works at his own expense.

SS-2 Rates and Prices Inclusive

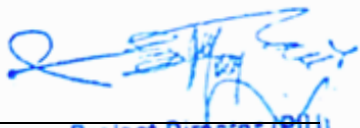
The rates and prices quoted by the Contractor in the priced Bill of Quantities include all freight, customs, import duties, taxes, pilotage, landing Supplementary Conditions of Contract charges, excise duties, royalties and all other costs, charges imposed whatsoever in respect of any or other things provided by him for the correct execution of work in compliance with the time Schedule and the Specifications.

By way of illustration but enumeration the Unit prices shall include besides the cost for supply of material and equipment, cost of their transport, Contractor's profit etc, for the cost of provision of the following:

- a. Furnishing and maintenance of Contractor's equipment, fuel for equipment, temporary works, tests, samples and labor necessary or execution of the works, Equipment for transport, machines, test laboratories, Site Office and sheds including all expenses for the furnishing and maintenance of the Workshops and storage areas used by the Contractor.
- b. Required power, water and other services.
- c. Illumination and safety at Site.
- d. All additional costs due to any kind of difficult working, conditions and interruptions which may possibly be caused by adverse physical conditions.
- e. Staff allowances, ambulances, expenses for medical treatment, traveling expenses, holiday wages and salaries and all other Costs for all employees, the required means of communications such as telephone and the like, the required means for protection against accidents.
- f. All expenses for royalties, licenses, liabilities insurances, rent, hire and the like in connection with the Works.
- g. Other special work arrangements and provisions not mentioned here but necessary for the proper and complete execution of the Works.
- h. All Government and/or Municipal taxes, customs duties, excise duties, stamp duties or any other dues, taxes or charges.
- i. Cost of all insurances to be kept in force during the period of construction and the period of maintenance of the works under the Contract.
- j. Mobilization, demobilization and clearance of site.
- k. Contractor's camp for staff and labor including the services.
- l. Performance security and Bank Guarantees as and when required under the Contract.

The cost of the above shall be deemed to be included in the rates and prices tendered for the works and no separate payment shall be made on this account.

SS-3 Provision of Plant



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In respect of any contractor's Equipment in general, except as provided for in these Documents, which the contractor shall be required to have available at Site for execution of Works in accordance with the Drawings, Specifications or as directed by the Employer, he shall make his own arrangements for foreign exchange, import formalities, customs transport to the Site of Works and all other formalities whatsoever at his own cost and responsibility.

The Contractor shall be deemed to have taken into consideration all Government or Local Bodies regulations, for the time being in force, regarding the re-export of any plant and equipment which he may have to import in connection with the works. Any amendments to the existing rules and/or further regulations imposed in this respect by the Government of Pakistan shall be strictly followed by the Contractor.

SS-4 Rates inclusive of Lead and Lift

The tendered rates shall include all lead and lift required in earthwork.

SS-5 Document not to be Altered or Mutilated

No alteration or mutilation (other than filling in all the blanks intended to be filled in) shall be made in the form of Tender or in any of the documents attached to it. Any comments which it is desired to make shall not be placed on any of the documents attached hereto, but shall take the form of a separate statement which shall be as brief as possible and referenced to items, clauses and pages of the annexed documents.

Such statements shall not qualify the acceptance of the Tender based upon proposed change or changes in the annexed documents, nor shall be binding upon the employer in any way in making the award. Alterations of already written prices must be signed in the place of alteration by the Tenderer or his legally authorized representative.

SS-6 Final Hand-Over

At the end of the Defects Liability Period stipulated in the Contract, the Employer on application of the Contractor, shall decide the members of the final hand over committee and announce the same to the Contractor. The committee, after investigation of work, if satisfied that there are no deficiencies or defects due to work of the Contractor, shall certify the final hand-over, and the Project Manager will then issue a Defects Liability Certificate as provided under Clause 62.1 of Conditions of Contract.

SS-7 Return of Plant, Materials etc.

The Contractor shall forward to the Employer at the end of each month returns showing the Constructional Plant, materials, etc., on Site, in a form prescribed by the Employer.

SS-8 As Built Drawings/Shop Drawings

During Construction, the Contractor shall keep an accurate record of all deviations of his work as actually installed from that shown or indicated on the Contract drawings upon completion of the Work, the Contractor shall deliver to the Employer cloth/milar paper tracings, the same size as Contract Drawing at and at an approved scale drawing showing the work as actually installed, all drawings are to become the property of the employer.

All the shop drawings/fabrication drawings shall be prepared by the contractor and submitted to the Project Manager at least fifteen days before the start of the work. The Project Manager shall check and approve or return the same to the Contractor for correction/modification within the period of 15 days from the day of receipt of the drawings. All work is to be executed by the Contractor in accordance with the drawings approved before the commencement of the works.

SS-9 Safety Precautions

The Contractor shall adequately provide for the safety, health and welfare of persons and for the prevention of damage to works, material, and equipment for the purpose of or in connection with the Contract.

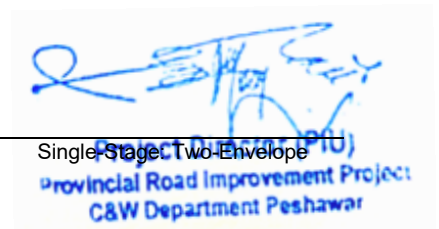
SS-10 Income Tax

A sum in Pakistani Rupees, in accordance with the prevailing income tax laws of Pakistan shall be deducted from all actual payments made to the Contractor and be deposited with the Government of Pakistan towards

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payment of income tax by the Contractor. When such deduction is made from the payments a certificate to that effect shall be issued by the Employer to the Contractor.

Notwithstanding such deduction of income tax at source, the Contractor shall be liable to pay the balance income tax, super tax and other taxes on income or his profits arising out of the Contract, and his employees on their remunerations et, in accordance with the prevailing income tax laws of Pakistan.



Supplementary Information Regarding Works to Be Procured

The Islamic Republic of Pakistan has applied for additional financing from the Asian Development Bank (ADB) towards the cost of additional roads under Khyber Pakhtunkhwa Provincial Roads Improvement Project. Part of this financing will be used for payments under the contracts named hereunder. Bidding is open to all Bidders, who can prove their eligibility and qualification as mentioned hereunder and in the Bidding Document(s), from eligible source countries of the ADB.

The proposed road design is to dualize the existing highways and scarifying or breaking the existing road surface, raising the finished level of road using aggregate base course with asphaltic base and wearing course surface. The proposed facility will have 7.3 meters wide carriageway with paved shoulders (2.5 m) and earthen shoulders of 0.5m width on either side of the carriageway. The Construction works involve removal of existing surfacing, some earth works, granular subbase course, aggregate base course and Asphaltic Base and Wearing Course surface, repair and reconstruction of bridges and slab culverts, drainage works and ancillary works etc. and or providing new culverts where required including road markings and road signs.



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Personnel Requirements

Using Form PER - 1 and PER - 2 in Section 4 (Bidding Forms), the Bidder must demonstrate that it has personnel who meet the following requirements:

No	Position	Minimum Qualification	Total Work Experience (years)	Experience in Similar Work (years)	No of Positions Required for Each Lot	
					Lot-1	Lot-2
1	Project Manager	BE (Civil Engineering)	20	10	1	1
2	Deputy Project Engineer/ Planning Engineer	BE (Civil Engineering) or equivalent	10	5	1	1
3	Material Engineer	BE (Civil Engineering) / Geological or equivalent	10	5	1	1
4	Structure Engineer	MS Structure Engineering	10	5	1	1
5	Highway Engineer	BE (Civil Engineering)	10	5	2	2
6	Qualified / Experienced Surveyors	DAE (Civil Engineering)	15	10	2	2
7	Gender Specialist	Master's in social sciences or equivalent Professional qualification	10	5	1	1
8	Quantity Surveyor	DAE (Civil Engineering)	15	10	1	1
9	Site Engineers	BE (Civil Engineering) or equivalent Professional qualification	10	5	4	4

Using Form EXP-6 in Section 4 (Bidding Forms), the Bidder must demonstrate that it has EHS personnel who meet the following requirements:

Key Personnel as determined by the EMP and other safeguard management plans

No	Position/ Specialization	Academic Qualifications	Minimum Years of Relevant Work Experience (Year)	Minimum Time On-site (%FTE)	No of Positions Required for Each Lot	
					Lot-1	Lot-2
1	Qualified Environmentalist	M.Sc. (Environment) or equivalent Professional qualification	10	50%	1	1

No	Position/ Specialization	Academic Qualifications	Minimum Years of Relevant Work Experience (Year)	Minimum Time On- site (%FTE)	No of Positions Required for Each Lot	
					Lot-1	Lot-2
2	Qualified Health and Safety Expert	M.Sc. (Public Health Engineering) or equivalent Professional qualification	10	50%	1	1



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Equipment Requirements

Using Form EQU in Section 4 (Bidding Forms), the Bidder must demonstrate that it has the key equipment listed below:

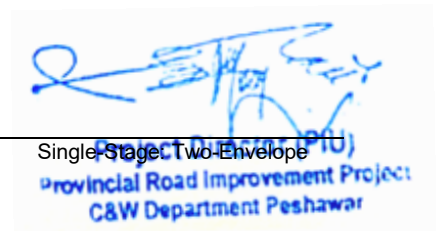
No	Position/ Specialization	Capacity	Minimum Number Required for Each Lot	
			Lot-1	Lot-2
1	Concrete Batching Plant	Minimum 35 Cu.m/hr	2	2
2	Crane	Minimum 20 ton	2	2
3	Concrete Pump		2	2
4	Concrete Transit Mixer	6 Cu.m Minimum	4	4
5	Complete Set of Shuttering & scaffolding (Steel)	Minimum 100 Sq.m	1	1
6	Rollers	Minimum 6 ton / 12 ton	5	5
7	Graders	Minimum 165 Hp	2	2
8	Dump Trucks	Minimum 135-405 cft	10	10
9	Wheel Loaders		4	4
10	Excavators	10-45 tons	2	2
11	Bull Dozers	Minimum 200 Hp	2	2
12	Bitumen Sprayers		2	2
13	Lane Marking Machines		4	4

Environmental Management and HSE Plan Attached.



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Land Acquisition and Resettlement Framework Attached.



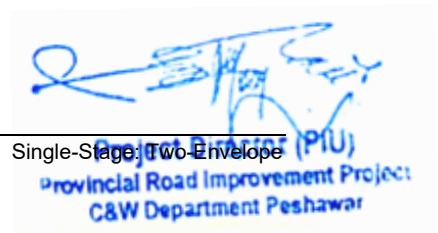
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A. General

1. Definitions	<p>1.1 Boldface type is used to identify defined terms.</p> <p>(a) The Accepted Contract Amount means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.</p> <p>(b) The Activity Schedule is a schedule of the activities comprising the construction, installation, testing, and commissioning of the Works in a lump sum contract. It includes a lump sum price for each activity, which is used for valuations and for assessing the effects of Variations and Compensation Events.</p> <p>(c) The Adjudicator is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in GCC 29.1 [Appointment of Adjudicator] hereunder.</p> <p>(d) Bank means the financing institutions named in the Particular Conditions of Contract (PCC).</p> <p>(e) Bill of Quantities means the priced and completed Bill of Quantities forming part of the Bid.</p> <p>(f) Compensation Events are those defined in GCC 51.1 [Compensation Events] hereunder.</p> <p>(g) The Completion Date is the date of completion of the Works as certified by the Project Manager, in accordance with GCC 69.1 [Completion].</p> <p>(h) The Contract is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC 2.3 below.</p> <p>(i) The Contractor is the party whose Bid to carry out the Works has been accepted by the Employer.</p> <p>(j) The Contractor's Bid is the completed bidding document submitted by the Contractor to the Employer.</p> <p>(k) The Contract Price is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.</p> <p>(l) Days are calendar days; months are calendar months.</p> <p>(m) Dayworks are varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.</p> <p>(n) A Defect is any part of the Works not completed in accordance with the Contract.</p> <p>(o) The Defects Liability Certificate is the certificate issued by the Project Manager upon correction of defects by the Contractor.</p> <p>(p) The Defects Liability Period is the period calculated from the Completion Date where the Contractor remains responsible for</p>
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	<p>remedying defects.</p> <p>(q) Drawings include calculations and other information provided or approved by the Project Manager for the execution of the Contract.</p> <p>(r) The Employer is the party who employs the Contractor to carry out the Works, as specified in the PCC.</p> <p>(s) Equipment is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.</p> <p>(t) Force Majeure means an exceptional event or circumstance: which is beyond a Party's control; which such Party could not reasonably have provided against before entering into the Contract; which, having arisen, such Party could not reasonably have avoided or overcome; and, which is not substantially attributable to the other Party.</p> <p>(u) In writing or written means hand-written, type-written, printed, or electronically made, and resulting in a permanent record.</p> <p>(v) The Initial Contract Price is the Contract Price listed in the Employer's Letter of Acceptance.</p> <p>(w) The Intended Completion Date is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is specified in the PCC. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.</p> <p>(x) Letter of Acceptance means the formal acceptance by the Employer of the Bid and denotes the formation of the Contract at the date of acceptance.</p> <p>(y) Materials are all supplies, including consumables, used by the Contractor for incorporation in the Works.</p> <p>(z) Party means the Employer or the Contractor, as the context requires.</p> <p>(aa) PCC means Particular Conditions of Contract.</p> <p>(bb) Plant is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.</p> <p>(cc) The Project Manager is the person named in the PCC (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.</p> <p>(dd) Retention Money means the aggregate of all monies retained by the Employer pursuant to GCC 55.1 [Retention].</p> <p>(ee) Schedules means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Bid, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices.</p> <p>(ff) The Site is the area defined as such in the PCC.</p>
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	<p>(gg) Site Investigation Reports are those that were included in the bidding documents and are factual and interpretative reports about the surface and subsurface conditions at the Site.</p> <p>(hh) Specification means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.</p> <p>(ii) The Start Date is given in the PCC. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.</p> <p>(jj) A Subcontractor is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.</p> <p>(kk) Temporary Works are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.</p> <p>(ll) A Variation is an instruction given by the Project Manager which varies the Works.</p> <p>(mm) The Works are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as defined in the PCC.</p>
<p>2. Interpretation</p>	<p>2.1 In interpreting these GCC, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.</p>
	<p>2.2 If sectional completion is specified in the PCC, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).</p>
	<p>2.3 The documents forming the Contract shall be interpreted in the following order of priority:</p> <ul style="list-style-type: none"> (a) Contract Agreement, (b) Letter of Acceptance, (c) Letter of Bid, (d) Particular Conditions of Contract, (e) the List of Eligible Countries that was specified in Section 5 of the bidding document, (f) General Conditions of Contract, (g) Specifications, (h) Drawings, (i) Completed Activity Schedules or Bill of Quantities, and (j) any other document listed in the PCC as forming part of the

	Contract.
3. Language and Law	<p>3.1 The language of the Contract and the law governing the Contract are stated in the PCC.</p> <p>3.2 Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in the Employer's country when</p> <p>(a) 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, or any payments to, a particular country, person, or entity. Where the Borrower's country prohibits payments to a particular firm or for particular goods by such an act of compliance, that firm may be excluded.</p>
4. Contract Agreement	<p>4.1 The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless the Particular Conditions establish otherwise. The Contract Agreement shall be based upon the attached Contract forms in Section 8. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer.</p>
5. Assignment	<p>5.1 Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either Party</p> <p>(a) may assign the whole or any part with the prior agreement of the other Party, at the sole discretion of such other Party; and</p> <p>(b) may, as security in favor of a bank or financial institution, assign its right to any moneys due, or to become due, under the Contract.</p>
6. Care and Supply of Documents	<p>6.1 The Specification and Drawings shall be in the custody and care of the Employer. Unless otherwise stated in the Contract, two copies of the Contract and of each subsequent Drawing shall be supplied to the Contractor, who may make or request further copies at the cost of the Contractor.</p> <p>6.2 Each of the Contractor's Documents shall be in the custody and care of the Contractor, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Contractor shall supply to the Engineer six copies of each of the Contractor's Documents.</p> <p>6.3 The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Employer's Personnel shall have the right of access to all these documents at all reasonable times.</p> <p>6.4 If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other Party of such error or defect.</p>
7. Confidential Details	<p>7.1 The Contractor's and the Employer's Personnel shall disclose all such confidential and other information as may be reasonably required in order to verify the Contractor's compliance with the Contract and allow</p>

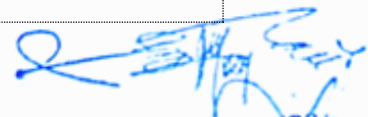
	its proper implementation.
	7.2 Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.
	7.3 Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this Clause.
8. Compliance with Laws	8.1 The Contractor shall, in performing the Contract, comply with applicable Laws.
	8.2 Unless otherwise stated in the Particular Conditions, <ul style="list-style-type: none"> (a) the Employer shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the [Employer's Country or country where the Site is located] which (i) such authorities or undertakings require the Employer to obtain in the Employer's name, and (ii) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract; (b) the Contractor shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the [Employer's Country or country where the Site is located] which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals, and/or licenses that are not the responsibility of the Employer under Subclause 8.2(a) hereof and that are necessary for the performance of the Contract. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to Subclause 8.1 hereof.
9. Joint and Several Liability	9.1 If the Contractor is a Joint Venture of two or more persons, all such persons shall be jointly and severally liable to the Employer for the fulfillment of the provisions of the Contract, and shall designate one of such persons to act as a leader with authority to bind the Joint Venture.

	The composition or the constitution of the Joint Venture shall not be altered without the prior consent of the Employer.
10. Project Manager's Decisions	10.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.
11. Delegation	11.1 The Project Manager may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may cancel any delegation after notifying the Contractor.
12. Communications	12.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.
13. Subcontracting	13.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.
14. Other Contractors	14.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as referred to in the PCC . The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.
15. Personnel and Equipment	15.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid to carry out the functions stated in the Schedule or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid. 15.2 If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within 7 days and has no further connection with the work in the Contract. 15.3 Should any employee of the Contractor be determined, based on reasonable evidence, to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the execution of the Works, then that employee shall be removed in accordance with Clause 15.2 above.
16. Employer's and Contractor's Risks	16.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.
17. Employer's Risks	17.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer's risks: (a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment).

	<p>which are due to</p> <ul style="list-style-type: none"> (i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works, or (ii) negligence, breach of statutory duty, or interference with any legal right by the Employer or by any person employed by or contracted to him except the Contractor. <p>(b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Employer or in the Employer's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.</p>
	<p>17.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer's risk except loss or damage due to</p> <ul style="list-style-type: none"> (a) a Defect which existed on the Completion Date, (b) an event occurring before the Completion Date, which was not itself an Employer's risk, or (c) the activities of the Contractor on the Site after the Completion Date.
18. Contractor's Risks	<p>18.1 From the Starting Date until the Defects Liability Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Employer's risks, are Contractor's risks.</p>
19. Insurance	<p>19.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles stated in the PCC for the following events, which are due to the Contractor's risks:</p> <ul style="list-style-type: none"> (a) loss of or damage to the Works, Plant, and Materials; (b) loss of or damage to Equipment; (c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and (d) personal injury or death.
	<p>19.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.</p>
	<p>19.3 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance, which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.</p>

	19.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.
	19.5 Both parties shall comply with any conditions of the insurance policies.
20. Site Investigation Reports	20.1 The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to in the PCC , supplemented by any information available to the Contractor.
21. Contractor to Construct the Works	21.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.
22. The Works to Be Completed by the Intended Completion Date	22.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.
23. Designs by Contractor and Approval by the Project Manager	23.1 The Contractor shall carry out design to the extent specified in the PCC . The Contractor shall promptly submit to the Employer all designs prepared by him. Within 14 days of receipt, the Employer shall notify any comments. The Contractor shall not construct any element of the permanent work designed by him within 14 days after the design has been submitted to the Employer or where the design for that element has been rejected. Design that has been rejected shall be promptly amended and resubmitted. The Contractor shall resubmit all designs commented on, taking these comments into account as necessary.
	23.2 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, who is to approve them if they comply with the Specifications and Drawings..
	23.3 The Contractor shall be responsible for design of Temporary Works.
	23.4 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.
	23.5 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.
	23.6 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use.
24. Safety	24.1 The Contractor shall be responsible for the safety of all activities on the Site.
25. Discoveries	25.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.
26. Possession of	26.1 The Employer shall give possession of all parts of the Site to the


the Site	Contractor. If possession of a part is not given by the date stated in the PCC , the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.
27. Access to the Site	27.1 The Contractor shall allow the Project Manager and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.
28. Instructions, Inspections, and Audits	<p>28.1 The Contractor shall carry out all instructions of the Project Manager, which comply with the applicable laws where the Site is located.</p> <p>28.2 The Contractor shall keep, and shall make all reasonable efforts to cause its Subcontractors and subconsultants to keep accurate and systematic accounts and records in respect of the Works in such form and details as will clearly identify relevant time changes and costs.</p>
	<p>28.3 The Contractor shall permit ADB or its representative to inspect the Contractor's site, assets, accounts, records, and other documents relating to the submission of bids and contract performance and to have them audited by auditors appointed by ADB. The Contractor shall maintain all documents and records related to the bid submission and execution of the Contract for at least 5 years after completing the works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer. The Contractor shall provide any documents necessary for the investigation of allegations of corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations and require its employees or agents with knowledge of the Contract to respond to questions from ADB.</p> <p>28.4 ADB's right to inspect the Site and/or the Contractor's accounts and records relating to the performance of the Contract stated in Sub-Clause 28.3 and 74.2 (e) shall survive termination and/ or expiration of this Contract.</p>
29. Appointment of the Adjudicator	29.1 The Adjudicator shall be appointed jointly by the Employer and the Contractor, at the time of the Employer's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority designated in the PCC , to appoint the Adjudicator within 14 days of receipt of such request.
	29.2 Should the Adjudicator resign or die, or should the Employer and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Employer and the Contractor. In case of disagreement between the Employer and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority at the request of either party, within 14 days of receipt of such request.
30. Procedure for Disputes	30.1 If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Project Manager's decision.



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	30.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.
	30.3 The Adjudicator shall be paid by the hour at the rate specified in the PCC , together with reimbursable expenses of the types specified in the PCC , and the cost shall be divided equally between the Employer and the Contractor, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision shall be final and binding.
	30.4 The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place specified in the PCC .
B. Staff and Labor	
31. Forced Labor	31.1 The Contractor shall not employ forced labor, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labor, such as indentured labor, bonded labor, or similar labor-contracting arrangements.
32. Child Labor	32.1 The Contractor shall not employ children in a manner that is economically exploitative, or is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where national laws have provisions for employment of minors, the Contractor shall follow those laws applicable to the Contractor. Children below the age of 18 years shall not be employed in dangerous work.
33. Workers' Organizations	33.1 In countries where national law recognizes workers' rights to form and to join workers' organizations of their choosing without interference and to bargain collectively, the Contractor shall comply with national law. Where national law substantially restricts workers' organizations, the Contractor shall enable alternative means for the Contractor's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. In either case described above, and where national law is silent, the Contractor shall not discourage the Contractor's Personnel from forming or joining workers' organizations of their choosing or from bargaining collectively, and shall not discriminate or retaliate against the Contractor's Personnel who participate, or seek to participate, in such organizations and bargain collectively. The Contractor shall engage with such workers representatives. Worker organizations are expected to fairly represent the workers in the workforce.
34. Nondiscrimination and Equal Opportunity	34.1 The Contractor shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In

	countries where national law provides for non-discrimination in employment, the Contractor shall comply with national law. When national laws are silent on nondiscrimination in employment, the Contractor shall meet this Subclause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination.
C. Time Control	
35. Program	35.1 Within the time stated in the PCC , after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works. In the case of a lump sum contract, the activities in the Program shall be consistent with those in the Activity Schedule.
	35.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.
	35.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period stated in the PCC . If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the PCC from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In the case of a lump sum contract, the Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager.
	35.4 The Project Manager's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.
36. Extension of the Intended Completion Date	36.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.
	36.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.
37. Acceleration	37.1 When the Employer wants the Contractor to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Employer accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Employer and the




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	Contractor.
	37.2 If the Contractor's priced proposals for an acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.
38. Delays Ordered by the Project Manager	38.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.
39. Management Meetings	39.1 Either the Project Manager or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.
	39.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.
40. Early Warning	40.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.
	40.2 The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.
D. Quality Control	
41. Identifying Defects	41.1 The Project Manager shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.
42. Tests	42.1 If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.
43. Correction of Defects	43.1 The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the PCC . The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

	43.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.
44. Uncorrected Defects	44.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount.
E. Cost Control	
45. Contract Price	45.1 In the case of an admeasurement contract, the Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.
	45.2 In the case of a lump sum contract, the Activity Schedule shall contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to monitor and control the performance of activities on which basis the Contractor will be paid. If payment for Materials on Site shall be made separately, the Contractor shall show delivery of Materials to the Site separately on the Activity Schedule.
46. Changes in the Contract Price	46.1 In the case of an admeasurement contract: <ul style="list-style-type: none"> (a) If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25%, provided the change exceeds 1% of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change. (b) The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15%, except with the prior approval of the Employer. (c) If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.
	46.2 In the case of a lump sum contract, the Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the Contractor's own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule.
47. Variations	47.1 All Variations shall be included in updated Programs, and, in the case of a lump sum contract, also in the Activity Schedule, produced by the Contractor.
	47.2 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.

	47.3 If the Contractor's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.
	47.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.
	47.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.
	47.6 In the case of an admeasurement contract, if the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in GCC 46.1 [Changes in the Contract Price] or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.
48. Cash Flow Forecasts	48.1 When the Program, or, in the case of a lump sum contract, the Activity Schedule, is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.
49. Payment Certificates	49.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.
	49.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.
	49.3 The value of work executed shall be determined by the Project Manager.
	49.4 The value of work executed shall comprise, <ul style="list-style-type: none"> (a) in the case of an admeasurement contract, the value of the quantities of work in the Bill of Quantities that have been completed; or (b) in the case of a lump sum contract, the value of work executed shall comprise the value of completed activities in the Activity Schedule.
	49.5 The value of work executed shall include the valuation of Variations and Compensation Events.

	49.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.
50. Payments	50.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Employer makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.
	50.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
	50.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.
	50.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.
51. Compensation Events	51.1 The following shall be Compensation Events: <ul style="list-style-type: none"> (a) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to GCC 26.1 [Possession of the Site]. (b) The Employer modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract. (c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time. (d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects. (e) The Project Manager unreasonably does not approve a subcontract to be let. (f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to Bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site. (g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional



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	<p>work required for safety or other reasons.</p> <p>(h) Other contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.</p> <p>(i) The advance payment is delayed.</p> <p>(j) The effects on the Contractor of any of the Employer's Risks.</p> <p>(k) The Project Manager unreasonably delays issuing a Certificate of Completion.</p>
	<p>51.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.</p>
	<p>51.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.</p>
	<p>51.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor's not having given early warning or not having cooperated with the Project Manager.</p>
52. Tax	<p>52.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 28 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC 54.1 [Price Adjustment].</p>
53. Currencies	<p>53.1 Where payments are made in currencies other than the currency of the Employer's country specified in the PCC, the exchange rates used for calculating the amounts to be paid shall be the exchange rates stated in the Contractor's Bid.</p>
54. Price Adjustment	<p>54.1 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the PCC. If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type indicated below applies to each Contract currency:</p> $P_c = A_c + B_c \text{ I}m_c/\text{I}o_c$

	<p>where:</p> <p>P_c is the adjustment factor for the portion of the Contract Price payable in a specific currency "c."</p> <p>A_c and B_c are coefficients¹ specified in the PCC, representing the nonadjustable and adjustable portions, respectively, of the Contract Price payable in that specific currency "c;" and</p> <p>I_{mc} is a consolidated index prevailing at the end of the month being invoiced and I_{oc} is the same consolidated index prevailing 28 days before Bid opening for inputs payable; both in the specific currency "c."</p>
	54.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.
55. Retention	55.1 The Employer shall retain from each payment due to the Contractor the proportion stated in the PCC until Completion of the whole of the Works.
	55.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 69.1 [Completion], half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. The Contractor may substitute retention money with an "on demand" bank guarantee.
56. Liquidated Damages	56.1 The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the PCC for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the PCC . The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.
	56.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC 50.1 [Payments].
57. Bonus	57.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day stated in the PCC for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify

¹ The sum of the two coefficients A_c and B_c should be 1 (one) in the formula for each currency. Normally, both coefficients shall be the same in the formulas for all currencies, since coefficient A, for the nonadjustable portion of the payments, is a very approximate figure (usually 0.10 ~ 0.20) to take account of fixed cost elements or other nonadjustable components. The sum of the adjustments for each currency is added to the Contract Price.

	that the Works are complete, although they may not be due to be complete.
58. Advance Payment	58.1 The Employer shall make advance payment to the Contractor of the amounts stated in the PCC by the date stated in the PCC , against provision by the Contractor of an unconditional bank guarantee in a form and by a bank acceptable to the Employer in amounts and currencies equal to the advance payment. The guarantee shall remain effective until the advance payment has been repaid, but the amount of the guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment.
	58.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.
	58.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.
59. Securities	59.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount specified in the PCC , by a bank acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 28 days from the date of issue of the Certificate of Completion in the case of a bank guarantee.
60. Dayworks	60.1 If applicable, the Dayworks rates in the Contractor's Bid shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.
	60.2 All work to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within 2 days of the work being done.
	60.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.
61. Cost of Repairs	61.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.
F. Force Majeure	

<p>62. Definition of Force Majeure</p>	<p>62.1 In this Clause, "Force Majeure" means an exceptional event or circumstance,</p> <ul style="list-style-type: none"> (a) which is beyond a Party's control; (b) which such Party could not reasonably have provided against before entering into the Contract; (c) which, having arisen, such Party could not reasonably have avoided or overcome; and (d) which is not substantially attributable to the other Party.
	<p>62.2 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:</p> <ul style="list-style-type: none"> (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies; (b) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war; (c) riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel; (d) munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity; and (e) natural catastrophes such as earthquake, hurricane, typhoon, or volcanic activity.
<p>63. Notice of Force Majeure</p>	<p>63.1 If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.</p>
	<p>63.2 The Party shall, having given notice, be excused from performance of its obligations for so long as such Force Majeure prevents it from performing them.</p>
	<p>63.3 Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.</p>
<p>64. Duty to Minimize Delay</p>	<p>64.1 Each Party shall at all times use all reasonable endeavours to minimize any delay in the performance of the Contract as a result of Force Majeure.</p>
	<p>64.2 A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.</p>

<p>65. Consequences of Force Majeure</p>	<p>65.1 If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under GCC Subclause 63 [Notice of Force Majeure], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to GCC Subclause 30.1 [Procedure for Disputes] to</p> <ul style="list-style-type: none"> (a) an extension of time for any such delay, if completion is or will be delayed, under GCC Subclause 36 [Extension of the Intended Completion Date]; and (b) if the event or circumstance is of the kind described in subparagraphs (a) to (d) of GCC Subclause 62.2 [Definition of Force Majeure] and, in the case of subparagraphs (b) to (d), occurs in the Country, payment of any such Cost, including the costs of rectifying or replacing the Works and/or Goods damaged or destructed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in GCC Subclause 19 [Insurance].
	<p>65.2 After receiving this notice, the Project Manager shall proceed in accordance with GCC Subclause 10 [Project Manager's Decisions] to agree or determine these matters.</p>
<p>66. Force Majeure Affecting Subcontractor</p>	<p>66.1 If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader Force Majeure events or circumstances shall not excuse the Contractor's nonperformance or entitle him to relief under this Clause.</p>
<p>67. Optional Termination, Payment and Release</p>	<p>67.1 If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under GCC Subclause 63 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with GCC Subclause 73.5 [Termination].</p>
	<p>67.2 Upon such termination, the Project Manager shall determine the value of the work done and issue a Payment Certificate, which shall include</p> <ul style="list-style-type: none"> (a) the amounts payable for any work carried out for which a price is stated in the Contract; (b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal; (c) other Costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works;

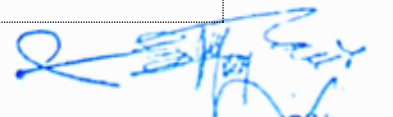
	<p>(d) the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost); and</p> <p>(e) the Cost of repatriation of the Contractor's staff and labor employed wholly in connection with the Works at the date of termination.</p>
68. Release from Performance	<p>68.1 Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises, which makes it impossible or unlawful for either or both Parties to fulfill its or their contractual obligations or which, under the law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstance,</p> <p>(a) the Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract; and</p> <p>(b) the sum payable by the Employer to the Contractor shall be the same as would have been payable under GCC Subclause 67 [Optional Termination, Payment and Release] if the Contract had been terminated under GCC Subclause 67.</p>
G. Finishing the Contract	
69. Completion	<p>69.1 The Contractor shall request the Project Manager to issue a certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the work is completed.</p>
70. Taking Over	<p>70.1 The Employer shall take over the Site and the Works within 7 days of the Project Manager's issuing a certificate of Completion.</p>
71. Final Account	<p>71.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.</p>
72. Operating and Maintenance Manuals	<p>72.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the PCC.</p>
	<p>72.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the PCC pursuant to GCC 72.1, or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount stated in the PCC from payments due to the Contractor.</p>

73. Termination	73.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.
	<p>73.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following:</p> <ul style="list-style-type: none"> (a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Project Manager; (b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 28 days; (c) the Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation; (d) a payment certified by the Project Manager is not paid by the Employer to the Contractor within 84 days of the date of the Project Manager's certificate; (e) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager; (f) the Project Manager gives two consecutive Notices to update the Program and accelerate the works to ensure compliance with GCC Subclause 22.1 [The Works to Be Completed by the Intended Completion Date] and the Contractor fails to update the Program and demonstrate acceleration of the works within a reasonable period of time determined by the Project Manager; (g) the Contractor does not maintain a Security, which is required; (h) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in the PCC; and (i) if the Contractor, in the judgment of the Employer has engaged in integrity violations in competing for or in executing the Contract, pursuant to GCC 74.1 [Fraud and Corruption].
	73.3 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC 73.2 above, the Project Manager shall decide whether the breach is fundamental or not.
	73.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.
	73.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.
74. Fraud and Corruption	74.1 If the Employer determines, based on reasonable evidence, that the Contractor has engaged in corrupt, fraudulent, collusive or coercive practices, or other integrity violations, including the failure to disclose any required information which constitutes a fraudulent practice, in

competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contract and expel him from the Site, and the provisions of Clause 73 {Termination} shall apply as if such termination had been made under Sub-Clause 73.2 (i).

74.2 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, agents, subcontractors, subconsultants, service providers, subsuppliers, manufacturers (including their respective officers, directors, employees and personnel) under ADB-financed contracts to observe the highest standard of ethics during the procurement and execution of such contracts in accordance with ADB's Anticorruption Policy (1998, as amended from time to time). In pursuance of this policy, the ADB

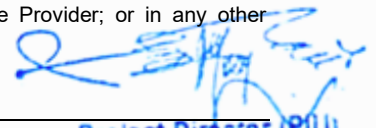
- (a) defines, for the purposes of this provision, the terms set forth below as follows:
- (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
 - (ii) "fraudulent practice" means any act 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 influence improperly 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 that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations; and
 - (vii) "integrity violation" is any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to (vi) above and the following: obstructive practice, 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 standard.



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	<p>(b) will reject a proposal for award if it determines that the Bidder recommended for award or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;</p> <p>(c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of ADB-financing 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;</p> <p>(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, including declaring ineligible, either indefinitely or for a stated period of time, to participate² 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; and</p> <p>(e) will have the right to require that a provision be included in bidding documents and in contracts financed, administered, or supported by ADB, requiring Bidders, suppliers and contractors, consultants, manufacturers, service providers 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 the site and their assets, accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.</p>
	<p>74.3 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:</p> <p>(a) being available to be interviewed and replying fully and truthfully to all questions asked;</p> <p>(b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other</p>

² Whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).



	<p>physical objects;</p> <p>(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;</p> <p>(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);</p> <p>(e) cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and</p> <p>(f) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.</p> <p>74.4 All Bidders, consultants, contractors and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in its contracts with its subconsultants, Subcontractors and other third parties engaged or involved in ADB-related activities, such subconsultants, Subcontractors and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.</p> <p>74.5 The Contractor undertakes that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the bid, have been given or received in connection with the procurement process or in the contract execution.³</p>
<p>75. Payment upon Termination</p>	<p>75.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as indicated in the PCC. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.</p>
	<p>75.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the</p>

³ The undertaking also applies during the period of performance of the contract

	certificate.
76. Property	76.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Contractor's default.
77. Release from Performance	77.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterward to which a commitment was made.
78. Suspension of ADB Loan or Credit	78.1 In the event that ADB suspends the Loan or Credit to the Employer, from which part of the payments to the Contractor are being made, <ul style="list-style-type: none"> (a) the Employer is obligated to notify the Contractor, with copy to the Project Manager, of such suspension within 7 days of having received ADB's suspension notice. (b) if the Contractor has not received sums due it within the 28 days for payment provided for in GCC 50.1 [Payments], the Contractor may immediately issue a 14-day termination notice.
79. Eligibility	79.1 The Contractor shall have the nationality of an eligible country as specified in Section 5 (Eligible Countries) of the bidding document. The Contractor shall be deemed to have the nationality of a country if the Contractor is a citizen or is constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.
	79.2 The materials, equipment, and services to be supplied under the Contract shall have their origin in eligible source countries as specified in Section 5 (Eligible Countries) of the bidding document and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, the Contractor may be required to provide evidence of the origin of materials, equipment, and services.
	79.3 For purposes of GCC 79.2, "origin" means the place where the materials and equipment are mined, grown, produced, or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

Section 8: Particular Conditions of Contract

The following Particular Conditions of Contract shall supplement the GCC. Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

A. General	
GCC 1.1 (d)	The financing institutions is Asian Development Bank (ADB)
GCC 1.1 (r)	<p>The Employer is Communication & Works Department, Government of Khyber Pakhtunkhwa</p> <p>Address: C&W Secretariat, Office of the Secretary C&W Department Peshawar, Khyber Pakhtunkhwa Pakistan</p> <p>Employer's Representative: Employer's Representative means Project Director, Project Implementation Unit, Khyber Pakhtunkhwa Rural Roads Development Project, Communication & Works Department Khyber Pakhtunkhwa, Government of Khyber Pakhtunkhwa</p> <p>Address: House No. 24, C/3 Circular Road, University Town, Peshawar, Khyber Pakhtunkhwa, Pakistan</p>
GCC 1.1 (w)	<p>The Intended Completion Date for the whole of the Works shall be:</p> <p>Lot-1: 730 days</p> <p>Lot-2: 730 days</p>
GCC 1.1 (cc)	<p>The Project Manager is:</p> <p>Team Leader of the Construction Supervision Consultant shall be appointed as Project Manager. Employer will notify before Start Date.</p>
GCC 1.1 (ff)	The Site is located in District Chitral and is defined in drawings attached.
GCC 1.1 (ii)	The Start Date shall be fourteen (14) days from signing of the Contract.
GCC 1.1 (mm)	The Works consist of Rehabilitation and Improvement Road and Structure Works.
GCC 2.2	Sectional Completions are: Not Applicable
GCC 2.3 (j)	<p>The following documents also form part of the Contract:</p> <ol style="list-style-type: none"> a. Site Specific Environmental Management Plan (SSEMP) b. Site Specific Health & Safety Management Plan (SSHSMMP) c. Details of Personnel (as provided in Section 6) d. Details of Equipment (as provided in Section 6) e. Method statement and Implementation Schedule f. Social Due Diligence Report (SDDR)
GCC 3.1	The language of the contract is English.

	The law that applies to the Contract is the law of Islamic Republic of Pakistan
GCC 11.1	The Project Manager may delegate any of his duties and responsibilities subject to prior approval of the Employer.
GCC 14.1	Schedule of other contractors: Not Applicable
GCC 19.1	<p>The minimum insurance amounts and deductibles shall be:</p> <p>(a) for loss or damage to the Works, Plant and Materials: 110% of the contract price</p> <p>(b) for loss or damage to Equipment: Full Replacement Value</p> <p>(c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract: 100% of the loss occurred.</p> <p>(d) for personal injury or death:</p> <p>(i) of the Contractor's employees: PKR 500,000/- in case of the injury for each occurrence and PKR 1,500,000/- in case of loss of limb, permanent deafness, sight and disability and PKR 5,000,000/- in case of death for each occurrence. (Occurrences unlimited)</p> <p>(ii) of other people: same as above</p> <p>(iii) The maximum deductible amount shall be "PKR Five (5) Million" against event under Para (a) herein above whereas "Nil" against events under Para (b), (c) and (d). The insurance will be from the companies rated "A" or higher by Pakistan Credit Rating Agency Limited.</p>
GCC 20.1	Site Investigation Reports are: Not Applicable
GCC 23.1	The following shall be designed by the Contractor: Temporary Diversion Works
GCC 24.1	<p><i>Please add the following as Sub-Clause 24.1:</i></p> <p><i>"The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel and to provide a safe work environment.</i></p> <p><i>The Contractor shall: (a) comply with applicable core labor standards and labor laws, and incorporate applicable workforce occupational safety norms; (b) comply with the applicable provisions of the Gender Action Plan, including equal pay to men and women for the same type of work and enabling working conditions for female workers; (g) to the extent possible, maximize employment of local poor and disadvantaged persons for project construction purposes, provided that the requirement for job and efficiency are adequately met; and (h) provide safe working conditions.</i></p> <p><i>The Contractor is responsible for establishment of preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks of the construction site work to the health and safety of local communities.</i></p> <p><i>Within 14 days of the Start Date the Contractor shall submit a detailed Site-Specific Health and Safety Management Plan (SSHSMP) for the Project Manager's no objection showing how he/she intends to comply with the local Health and Safety laws and regulations and other specific requirements prescribed in the Contract,</i></p>


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	<p><i>taking into account the Supplementary Information in Section 6- Employer's Requirements.</i></p> <p><i>Where unanticipated health and safety hazards or risks become apparent during the Contract, the Contractor is required to update the SSHSMP to outline the potential impacts to site works and associated mitigation measures for the Project Manager's no objection.</i></p> <p><i>The Contractor shall comply with the approved SSHSMP and any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor the implementation of the project EMP through the SSHSMP.</i></p> <p><i>The Contractor shall bear the costs to ensure that such measures, requirements and actions are carried out. The Contractor shall submit monthly reports on the compliance of such measures to the Employer.</i></p> <p><i>In the event of a significant injury involving medical treatment or hospitalization and fatal accident the Contractor shall notify the Project Manager immediately by verbal communication and submit a formal report as soon as practicable after its occurrence.</i></p> <p><i>For all accidents, whether fatal or not, the Contractor shall also notify the appropriate local authorities in accordance with the Laws of the Country.</i></p> <p><i>The Contractor shall disseminate information (in local languages) on the risks of sexually transmitted diseases, including HIV/AIDs, in health and safety program for all construction works at campsites. Compliance to the foregoing will be strictly monitored by the Employer</i></p>
GCC 26.1	The Site Possession Date(s) shall be: 28 days after Start Date.
GCC 29.1	Appointing Authority for the Adjudicator: Chartered Institute of Arbitrators, Pakistan
GCC 30.3	<p>The Adjudicator shall be paid by the hour at the rate of: PKR 10,000 (ten thousand)</p> <p>The reimbursable expenses are: Actual transportation expenses incurred. Transportation expenses should be by economy class travel whether by air or land. Adjudicator shall be entitled to a per diem of PKR 10,000 (ten thousand) per day.</p>
GCC 30.4	<p>Institution whose arbitration procedures shall be used:</p> <p>(a) Contracts with foreign contractors:</p> <p>International arbitration shall be conducted in accordance with the rules of Singapore International Arbitration Centre (SIAC).</p> <p>Arbitration shall be administered by SIAC.</p> <p>The place of arbitration shall be: Singapore.</p> <p>(b) Contracts with domestic contractors:</p> <p>Arbitration shall be carried out in accordance with the rules and provision of Arbitration Act 1940 of Islamic Republic of Pakistan. The place of arbitration shall be "Peshawar, Islamic Republic of Pakistan".</p>
GCC 32.1	Please add the following at the end of Sub-Clause 32.1:

	<i>“Child” means a child below the statutory minimum age of 14 under applicable national, provincial or law of Pakistan.”</i>
GCC 34.2	<p>The following sentence shall apply:</p> <p>Respectful Work Environment</p> <p>The Contractor shall ensure that its employees and Subcontractors observe the highest ethical standards and refrain from any form of bullying, discrimination, misconduct and harassment, including sexual harassment and shall, at all times, behave in a manner that creates an environment free of unethical behavior, bullying, misconduct and harassment, including sexual harassment. The Contractor shall take appropriate action against any employees or Subcontractors, including suspension or termination of employment or sub-contract, if any form of unethical or inappropriate behavior is identified.</p> <p>The Contractor shall conduct training programs for its employees and sub-contractors to raise awareness on and prevent any form of bullying, discrimination, misconduct and harassment including sexual harassment, and to promote a respectful work environment. The Contractor shall keep an up-to-date record of its employees and Subcontractors who have attended and completed such training programs and provide such records to the Employer or the Project Manager at their first written request.</p>
C. Time Control	
GCC 35.1	The Contractor shall submit for approval a Program for the Works within 42 days from the date of the Letter of Acceptance. <i>The program shall be submitted in the form of MS Project or other similar software (3 Nos. hard and soft copies) by allocating the equipment and other resources, moreover, the critical activities shall be identified. The program shall include information on equipment for the Contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail as advised and approved by the Project Manager. The Contractor shall include as part of its program submitted; a detail forecasted cash flow in a format acceptable to the Project Manager.</i>
GCC 35.3	<p>The period between Program updates is fourteen (14) days.</p> <p>The amount to be deducted for late submission of a Program/updated Program is PKR 50,000 (Fifty Thousand Pakistan Rupees) per week (non-refundable).</p>
D. Quality Control	
GCC 40.1	<p>Please add the following at the end of Sub-Clause 40.1:</p> <p><i>“In addition to the foregoing, the Contractor shall provide the Project Manager with a written notice of any unanticipated environmental or resettlement impacts that arise during construction, implementation or operation”</i></p>
GCC 43.1	The Defects Liability Period is: Three Hundred and Sixty-Five (365) days from the Completion Date.
E. Cost Control	
GCC 53.1	The currency of the Employer’s country is: Pakistani Rupees (PKR).



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GCC 54.1	<p>The Contract shall be subjected to price adjustment:</p> <p>Clause 54.1 of GCC is deleted in entirety and replaced with the following:</p> <p>The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the currencies in which the Contract Price is payable. No adjustment is to be applied to work valued on the basis of Cost or current prices. The formulae shall be of the following general type:</p> $P_n = a + b \frac{L_n}{L_o} + c \frac{E_n}{E_o} + d \frac{M_n}{M_o} + \dots$ <p>where:</p> <p>“P_n” is the adjustment multiplier to be applied to the estimated contract value in the relevant currency of the work carried out in period “n”, this period being a month unless otherwise stated in the Contract.</p> <p>“a” is a fixed coefficient, stated in the relevant table of adjustment data, representing the non-adjustable portion in contractual payments.</p> <p>“b”, “c”, “d”, ... are coefficients representing the estimated proportion of each cost element related to the execution of the Works, as stated in the relevant table of adjustment data; such tabulated cost elements may be indicative of resources such as labour, equipment and materials.</p> <p>“L_n”, “E_n”, “M_n”, ... are the current cost indices or reference prices for period “n”, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the date 28 days prior to the last day of the period (to which the particular Payment Certificate relates); and</p> <p>“L_o”, “E_o”, “M_o”, ... are the base cost indices or reference prices, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the Base Date.</p> <p>The cost indices or reference prices stated in the table of adjustment data shall be used. If their source is in doubt, it shall be determined by the Project Manager. For this purpose, reference shall be made to the values of the indices at stated dates for the purposes of clarification of the source, although these dates (and thus these values) may not correspond to the base cost indices.</p> <p>Until such time as each current cost index is available, the Project Manager shall determine a provisional index for the issue of Payment Certificates. When a current cost index is available, the adjustment shall be recalculated accordingly.</p> <p>If the Contractor fails to complete the Works within the Intended Completion Date, adjustment of prices thereafter shall be made using either (i) each index or price applicable on the date 28 days prior to the expiry of the Intended Completion Date of the Works, or (ii) the current index or price, whichever is more favourable to the Employer.</p> <p>The weightages for each of the factors of cost given in Section-4 Table-A shall not be adjusted during currency of the contract.</p>
GCC 54.2	Clause 54.2 of GCC is deleted in entirety.
GCC 55.1	The proportion of payments retained is: Five Percent (5%) .
GCC 56.1	The liquidated damages for the whole of the Works are 0.1% per day.

	The maximum amount of liquidated damages for the whole of the Works is 10% of the final Contract Price.
GCC 57.1	Bonus on early Completion of Works is 0.05% of the final Contract Price per day, up to a maximum of 5%, for each day the Works are completed before the Intended Completion Date defined in PCC and GCC 1.1 (w) except that provision of this sub clause shall not apply, if any extension of intended completion date is granted to the Contractor pursuant to GCC, Clause 36 for any reason.
GCC 58.1	<p>The Advance Payments shall be fifteen percent (15%) and shall be paid to the Contractor no later than 56 days from the date the corresponding bank guarantee delivered by the Contractor and has been verified by the Employer from the issuing bank.</p> <p>Fifteen Percent (15%) of the Accepted Contract Amount payable in two (02) instalments in the currencies in which the Accepted Contract Amount is payable. The first instalment i.e., seven percent (07%) shall be paid after the Contractor furnishes the advance payment guarantee required by Clause 58 [Advance Payment] of GCC, and the second instalment i.e., eight percent (08%) shall be paid after the Contractor completes mobilization and the Project Manager issues a certification to the Employer of such completion. For the avoidance of doubt, (i) the advance payment guarantee required to release the first instalment shall be in an amount equal to the total amount of the advance payment; (ii) the complete mobilization required to release the second instalment of eight percent (08%) shall mean the Contractor's mobilization of all of the equipment and human resources required for the execution of the first three (03) months of the Permanent Works in accordance with the Program submitted by the Contractor under Clause 35 [Program]; (iii) if the Contractor is a joint venture, the release of the second instalment shall be further conditioned upon the certification of the Project Manager that all resources have been mobilized to site in accordance with the joint venture agreement; and (iv) fulfilment of the Contractor's obligation for providing facilities which include but are not limited to accommodation and vehicles for the Supervisory Consultant under Bill No. 7 [General Items] of Bill of Quantities.</p>
GCC 58.3	Repayment of the Advance Payments shall be: Twenty Percent (20%) from each and subsequent payment certificate.
GCC 59.1	The Performance Security amount is 10% of the accepted contract amount. In case of Joint Venture, the performance security must be in the name of Joint Venture. The Performance Security shall be issued either (a) By a reputable bank, which may include scheduled banks, located in the Country, or (b) by a reputable foreign bank, selected by the Contractor and acceptable to the Employer for the entire duration of the Contract and till the issuance of the Defect Liability Certificate. If the bank issuing the Performance Security furnished by the Contractor is outside the Country, the issuer shall have a correspondent bank in the Country to make it enforceable in the Country. The Performance Security shall be in the form annexed to the Bidding Document.
G. Finishing the Contract	
GCC 69.2	<p>Please add the following as Sub-Clause 69.2:</p> <p><i>"Upon the completion of construction, the Contractor shall fully reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition as recorded by the Contractor in consonance with its obligation</i></p>

	<i>in Clause 22.”</i>
GCC 71.1	<p><i>Add the following at the end of this sub-clause:</i></p> <p><i>On expiry of the Defects Liability Period, the Employer / Employer’s representative shall constitute a committee comprising of Project Manager / Project Manager’s representative, Employer / Employer’s representative and the Contractor / Contractor’s representative. The committee shall conduct a detailed inspection of the Works to ascertain the completion of any outstanding Work stated in Completion Certificate and remedying of defects to ascertain to the Project Manager for issuance of Defects Liability Certificate or otherwise.</i></p>
GCC 72.1	<p>The date by which operating, and maintenance manuals are required is 30 days after issuance of the Completion Certificate.</p> <p>The date by which “as built” drawings are required is before issuance of the Certificate of Completion</p>
GCC 72.2	<p>The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals by the date required in GCC 72.1 is PKR 1,000,000. (PKR One Million).</p>
GCC 73.2 (h)	<p>The maximum number of days is: 100 days</p>
GCC 75.1	<p>The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, is ten percent (10%).</p>
GCC 80 Monthly Progress Reports	<p>Please add the following as new Clause 80:</p> <p><i>“The Contractor shall provide the Project Manager with Monthly reports of its activities, including each of its obligations under the Contract and to the satisfaction of the Project Manager.”</i></p>
GCC 81 EMP Implementation	<p>Please add the following as new Sub-Clause 81:</p> <p><i>“The Contractor shall comply with all applicable national, provincial, and local environmental laws and regulations.</i></p> <p><i>The Contractor shall (a) establish an operational system for managing environmental impacts, (b) carry out all the monitoring and mitigation measures set forth in the Environmental Management Plan (“EMP”), (c) allocate the budget required to ensure that such measures are carried out, and (d) comply with any corrective or preventative actions instructed by the Project Manager.”</i></p> <p><i>The Contractor shall appoint an Environmental Officer to serve as his organization’s primary point of contact for any environmental management issues. The Environmental Officer will have authority to direct any aspect of the contractor’s operations to implement the requirements of the Environmental Management Plan, site-specific environmental management plans, and any instructions from the Project Manager.</i></p> <p><i>The Contractor’s Environmental Officer is required to have qualifications in Environmental Management, Environmental Science or a similar discipline and be able to complete the preparation of site-specific environmental management plans.</i></p> <p><i>Following the award of the contract and prior to construction commencing, the Contractor will review the EMP and develop it into a detailed site-specific Environmental Management Plan(s) (SEMP) that amplifies the conditions</i></p>

established in the EMP that are specific for the site and the tasks involved. The SEMP(s) will be submitted to the Project Manager for approval at least 10 days before taking possession of any work site. The Project Management Unit will approve the SEMP before granting access to the site.

The Contractor shall prepare and submit monthly environmental monitoring reports to the Project Manager. These reports shall include but are not limited to: (i) a summary of environmental monitoring activities carried out during the reporting period; (ii) the results of environmental sampling and testing; (iii) information about non-compliances and corrective actions taken; and (iv) community concerns raised.

The Contractor will have a system for recording and communicating any complaints received by any person employed by or contracted with the Contractor. The Contractor will communicate all complaints in writing to the Project Manager within one working day of their receipt.

The Contractor will ensure the provision of induction training in environmental issues and the requirements for environmental management to all personnel under his employment or contract. The Contractor will keep records of attendance at the training. The contractor will provide on-going training to all personnel employed or contracted by him on environmental issues and the requirements for environmental management.



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Section 9: Contract Forms

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Notice of Intention for Award of Contract

[on letterhead paper of the Employer]

[date of notification]

To: [name of the Bidder]
 Attention: [insert name of the Bidder's authorized representative]
 Address: [insert address of the Bidder's authorized representative]
 Telephone/Fax numbers: [insert telephone/fax numbers of the Bidder's authorized representative]
 E-mail Address: [insert e-mail address of the Bidder's authorized representative]

This is to notify you of our intention to award the contract [insert name of the contract and identification number, as given in the Bid Data Sheet]. You have [insert number of days as specified in ITB 41.1 of the BDS] days from the date of this notification to (i) request for a debriefing in relation to the evaluation of your Bid; and/or (ii) submit a bidding-related complaint in relation to the intention for award of contract, in accordance with the procedures specified in ITB 46.1.

The summary of the evaluation are as follows:

1. List of Bidders

Name of Bidder	Bid Price as Read Out at Opening	Evaluated Bid Price

2. Reason/s Why Your Bid Was Unsuccessful

.....

3. The Successful Bidder

Name of Bidder:	
Address:	
Accepted Contract Amount:	
Duration of Contract:	
Scope of the Contract Awarded:	
Amount Performance Security Required:	

Authorized Signature:
 Name and Title of Signatory:
 Name of Agency:



Letter of Acceptance

[on letterhead paper of the Employer]

[date]

To: [Name and address of the contractor]

Subject: Contract No. [please specify]

This is to notify you that your Bid dated [date] for execution of the [name of the contract and identification number, as given in the Bid Data Sheet] for the Accepted Contract Amount of the equivalent of [amount in words and figures and name of currency], as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract and any additional security required as a result of the evaluation of your bid, using for that purpose the Performance Security Form included in Section 9 (Contract Forms) of the Bidding Document.

[Choose one of the following statements:]

We accept that [insert the name of adjudicator proposed by the Bidder] be appointed as the Adjudicator.

[or]

We do not accept that [insert the name of the adjudicator proposed by the Bidder] be appointed as the Adjudicator, and by sending a copy of this Letter of Acceptance to [insert name of the appointing authority], the Appointing Authority, we are hereby requesting such Authority to appoint the Adjudicator in accordance with GCC 29.1.

Authorized Signature:

Name and Title of Signatory:

Name of Agency:

Attachment: Contract Agreement



Contract Agreement

THIS AGREEMENT made the [date] day of [month], [year], between [name of the Employer] (hereinafter “the Employer”), of the one part, and [name of the contractor] (hereinafter “the Contractor”), of the other part:

WHEREAS the Employer desires that the Works known as [name of the contract] should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - (a) Letter of Acceptance,
 - (b) Letters of Technical Bid and Price Bid,
 - (c) Addenda Nos. [insert addenda number if any]¹
 - (d) Particular Conditions of Contract,
 - (e) List of Eligible Countries that was specified in Section 5 of the bidding document,
 - (f) General Conditions of Contract,
 - (g) Specifications,
 - (h) Drawings,
 - (i) Completed Activity Schedules or Bill of Quantities, and
 - (j) any other documents shall be added here.²
3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

¹ Information contained in the addenda and or addendum should preferably be included in the contract documents to avoid potential ambiguities during contract implementation. If however, unavoidable priority should be decided depending on the nature of information provided in the addenda/addendum.

² Tables of Adjustment Data may be added if the contract provides for price adjustment (see GCC 54.1).



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IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of [name of the borrowing country] on the day, month and year indicated above.

Signed by
for and on behalf of the Employer

Signed by
for and on behalf the Contractor

in the presence of:

in the presence of:

Witness, Name, Signature, Address, Date

Witness, Name, Signature, Address, Date



Performance Security

[Bank's name, and address of issuing branch or office]

Beneficiary: [Name and address of the Employer]

Date:

Performance Guarantee No.:

We have been informed that [name of the contractor] (hereinafter called "the Contractor") has entered into Contract No. [reference number of the contract] dated [date] with you, for the execution of [name of contract and brief description of works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we [name of the bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of [name of the currency and amount in words]¹ [amount in figures] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the [date] day of [month], [year]², and any demand for payment under it must be received by us at this office on or before that date.

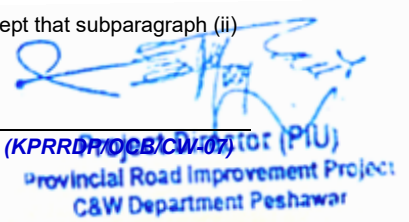
This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revisions, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.³

.....
[Signature(s) and seal of bank (where appropriate)]

-- Note to Bidder --

If the bank issuing performance security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.

- ¹ The guarantor shall insert an amount representing the percentage of the contract price specified in the contract and denominated either in the currency(ies) of the contract or in any freely convertible currency acceptable to the Employer. If the bank issuing the performance security is located outside the country of the employer, it shall have a correspondent financial institution located in the country of the Employer.
- ² Insert the date 28 days after the defect liability period. The Employer should note that in the event of an extension of the time for completion of the contract, the employer 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 employer 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 Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."
- ³ Or the employer may use "Uniform Rules for Demand Guarantees (URDG), ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded" as appropriate.



Advance Payment Security

[Bank's name, and address of issuing branch or office]

Beneficiary: [Name and address of the Employer]
Date:
Advance Payment Guarantee No.:

We have been informed that [name of the contractor] (hereinafter called "the Contractor") has entered into Contract No. [reference number of the contract] dated [date] with you, for the execution of [name of contract and brief description of works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum [name of the currency and amount in words]¹ [amount in figures] is to be made against an advance payment guarantee.

At the request of the Contractor, we [name of the bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of [name of the currency and amount in words]² [amount in figures] upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor:

- (a) used the advance payment for purposes other than the costs of mobilization and cash flow support in respect of the Works; or
- (b) has failed to repay the advance payment when it has become due and payable in accordance with the conditions of the Contract, specifying the amount payable by the Contractor.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number [contractor's account number] at [name and address of the bank].

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that eighty percent (80%) of the Contract Price has been certified for payment, or on the [date] day of [month], [year]³, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revisions, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.⁴

.....
[Signature(s) and seal of bank (where appropriate)]

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

² Footnote 1.

³ Insert the expected expiration date of the time for completion. The Employer should note that in the event of an extension of the time for completion of the contract, the Employer 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 Employer 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 Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

⁴ Or the employer may use "Uniform Rules for Demand Guarantees (URDG), ICC Publication No. 458, except that subparagraph (f) of Sub-article 20(a) is hereby excluded" as appropriate.

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-- Note to Bidder --

If the bank issuing advance payment security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.



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KPRRDP/OCB/CW-07

**PACKAGE-7: REHABILITATION AND IMPROVEMENT OF
FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT
CHITRAL IO2-LOTS1**

ANNEXURE – A

BILL OF QUANTITIES



Project Director (PIU)
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C&W Department Peshawar

KPRRDP/OCB/CW-07

**PACKAGE-7: REHABILITATION AND IMPROVEMENT OF
FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT
CHITRAL IO2-LOTSI**

LOT-1

**REHABILITATION AND IMPROVEMENT OF
RURAL ACCESS AND FLOOD AFFECTED ROADS
(IO2-ROADS OF 42.30 KM LENGTH), DISTRICT
CHITRAL**


Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA


KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH], DISTRICT CHITRAL

SUMMARY OF BILLS

S/NO	DESCRIPTION	TOTAL AMOUNT N-CHT-6	TOTAL AMOUNT N-CHT-7	TOTAL AMOUNT IN FIGURES (RS)
1	BILL NO: 1 EARTH WORK			
2	BILL NO: 2 ROAD WORK (SUB-BASE, BASE AND SURFACE COURSE)			
3	BILL NO: 3 CULVERTS AND CAUSEWAYS			
4	BILL NO: 4 RETAINING WALLS AND BREAST WALL			
5	BILL NO: 4a CONSTRUCTION OF RCC BRIDGES			
6	BILL NO: 5 DRAINAGE AND ANTI EROSION WORK			
7	BILL NO: 6 ANCILLARY WORKS			
8	BILL NO: 6d CLEARANCE OF SNOWFALL	168,409,037.80	13,980,000.00	182,389,037.80
9	BILL NO: 7 GENERAL ITEMS	168,409,037.80		168,409,037.80
TOTAL AMOUNT OF CIVIL WORK:				
TOTAL AMOUNT OF CIVIL WORK IN MILLIONS:				


Project Director (PIU)
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GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH], DISTRICT CHITRAL [TIRCH ROAD FROM NISHKO BRIDGE TO SHAHGROOM TIRCH]

SUMMARY OF BILLS

S/NO	DESCRIPTION	TOTAL AMOUNT IN FIGURES (RS)
1	BILL NO: 1 EARTH WORK	
2	BILL NO: 2 ROAD WORK (SUB-BASE, BASE AND SURFACE COURSE)	
3	BILL NO: 3 CULVERTS AND CAUSEWAYS	
4	BILL NO: 4 RETAINING WALLS AND BREAST WALL	
5	BILL NO: 4a CONSTRUCTION OF RCC BRIDGES	
6	BILL NO: 5 DRAINAGE AND ANTI EROSION WORK	
7	BILL NO: 6 ANCILLARY WORKS	
8	BILL NO: 6d CLEARANCE OF SNOWFALL	32,620,000.00
9	BILL NO: 7 GENERAL ITEMS	168,409,037.80
TOTAL AMOUNT OF CIVIL WORK:		
TOTAL AMOUNT OF CIVIL WORK IN MILLIONS:		

GOVERNMENT OF KHYBER PAKHTUNKHWA


KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [TIRCH ROAD FROM NISHKO BRIDGE TO SHAHGROOM TIRCH]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL NO: 1 EARTH WORK						
101	Clearing and Grubbing.	SM	49,500.00			
104	Compaction of Natural Ground.	SM	49,500.00			
108a	Formation of Embankment from Road way excavation in common material	CM	32,166.23			
108b (iii)	Formation of Embankment from Roadway excavation in Soft Rock Material	CM	21,444.15			
106a / 106c	Excavate Unsuitable Common Material	CM	70,074.28			
106b (i)	Excavate Unsuitable Hard Rock Material Unclassified	CM	46,716.19			
106b (ii)	Excavate Unsuitable Medium Rock Material Unclassified	CM	36,098.87			
106b (iii)	Excavate Unsuitable Soft Rock Material Unclassified	CM	59,456.97			
109a	Subgrade preparation in Earth Cut	SM	59,400.00			
Total:						


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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [TIRCH ROAD FROM NISHKO BRIDGE TO SHAHGROOM TIRCH]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 2 ROAD WORK (SUB-BASE, BASE AND SURFACE COURSE)						
201	Granular Sub Base	CM	26,790.00			
401a2 ii	Concrete Class A2 (ON GROUND)	CM	30,158.00			
310.2.3	Providing and laying Polythene sheet heavy weight under rigid pavement including overlapping, wastage and cortage etc.complete as per drawing.	SM	146,755.00			
SIW-15 406a	Premoulded Joint Filler 20 mm Thick with Bitumastic joint seal	M	29,302.00			
Total:						


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GOVERNMENT OF KHYBER PAKHTUNKHWA


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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [TIRCH ROAD FROM NISHKO BRIDGE TO SHAHGROOM TIRCH]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 3 (CULVERTS AND CAUSEWAYS)						
107a	Structural Excavation in Common Material.	CM	1,490.00			
401f	Lean Concrete	CM	376.00			
401 a3ii	Concrete Class A3 (On ground)	CM	1,990.00			
404b	Reinforcement as per AASHTO M 31 Grade 60	Ton	203.08			
507 b	Rock Fill in Gabions	CM	6,960.00			
SIW-17 507 a	Steel Wire Mesh for Gabion	SM	12,000.00			
501d	R.C.C. Pipe Culvert AASHTO M 170 Class II Dia 610 mm	M	150.00			
501f	R.C.C. Pipe Culvert AASHTO M 170 Class II Dia 910 mm	M	60.00			
502 b	Concrete Class B in Bedding and Encasement of Concrete Pipe Culvert.	CM	351.00			
SIW-13	Providing and filling sand behind abutment of culverts and causeways	CM	4,001.00			
Total:						


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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [TIRCH ROAD FROM NISHKO BRIDGE TO SHAHGROOM TIRCH]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 4 (RETAINING WALLS AND TOE WALLS)						
107a	Structural Excavation in Common Material.	CM	30,168.00			
107e	Common Backfill	CM	6,366.00			
401b	Concrete Class B	CM	3,371.00			
401a1 (ii)	Concrete Class A1 (ON GROUND)	CM	454.00			
401f	Lean Concrete	CM	6,294.00			
SIW-8 401h	Plum Concrete (Class 'B' with 40% Boulders/ Rock) as per drawing & Engineer's Instructions	CM	83,152.00			
Total:						


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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [TIRCH ROAD FROM NISHKO BRIDGE TO SHAHGROOM TIRCH]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 4a (CONSTRUCTION OF RCC BRIDGES)						
407i	Pile Load Tests to 2 times the design load	Each	3.00			
SIW 7 (Item 407)	Exploratory/Confirmatory Boring and Soil testing, including soil investigation report					
SIW 7 a	Exploratory/Confirmatory Boring	M	120.00			
SIW 7 b	Soil testing, / investigation report	L.Sum	3.00			
407d	Cast-in-place, Reinforced Concrete Cylindrical Piles dia 1200 mm	M	1,125.00			
107a	Structural Excavation in Common Material.	CM	1,472.63			
401f	Lean Concrete	CM	243.64			
401a3 (i)	Concrete Class 'A 3' (UNDER GROUND)	CM	879.16			
401a3 (ii)	Concrete Class 'A 3' (ON GROUND)	CM	586.10			
404b	Reinforcement as per AASHTO M 31 Grade 60	Ton	474.04			
SIW-13	Providing and filling sand behind abutment of bridges	CM	4,161.60			
407-7(b)	Supply and Fabrication of Permanent Lining	Kg	8,679.51			
406 e	Elastomeric Bearing Pads & as per approved drawing	Cu.cm	158,400.00			
401 d ii	Concrete Class 'D 2'	CM	332.29			
SIW 4 405b	Launching of Girders in place including lifting, handling and temporary works	M	400.00			
SIW-5	Galvanized Iron Drain Pipe, 75 mm Diameter	Each	104.00			
401a3 (iii)	Concrete Class 'A 3' (ELEVATED)	CM	286.06			
SIW 12 406c	Supply and place in position expansion joint assemblies as specified & as per approved drawing	M	65.10			
SIW 4 405a	Prestressing High Tensile Steel Including Sheathing, Anchorages, Assemblies, Grouting and Stressing Complete in All Respect	KG	14,165.38			
SIW-6	PVC Pipe sched. 40 200 mm Dia. for Services.	M	560.00			
Total:						

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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [TIRCH ROAD FROM NISHKO BRIDGE TO SHAHGROOM TIRCH]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 5 (DRAINAGE AND ANTI EROSION WORK)						
107a	Structural Excavation in Common Material.	CM	4,604.00			
107e	Common Backfill	CM	5,363.00			
401b	Concrete Class B	CM	6,435.00			
401a1ii	Concrete Class A1 (ON GROUND)	CM	68.00			
404 b	Reinforcement as per AASHTO M 31 Grade 60	Ton	10.68			
507 b	Rock Fill in Gabions	CM	18,270.00			
SIW-17 507 a	Steel Wire Mesh for Gabion	SM	31,500.00			
401f	Lean Concrete	CM	1,778.00			
Total:						


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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [TIRCH ROAD FROM NISHKO BRIDGE TO SHAHGROOM TIRCH]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 6 (ANCILLARY WORKS)						
610 c	Kilometer Post	EACH	30.00			
607 a	Traffic Road Signs Category 1 Size 75 CM	EACH	15.00			
607 b	Traffic Road Signs Category 2 Size dia 75 CM	EACH	10.00			
607c	Traffic Road Signs Category 3 (a)	EACH	7.00			
607 d	Traffic Road Signs Category 3 (b)	EACH	6.00			
608 h	Pavement Marking in reflective TP paint for line of 15 cm width.	M	78,000.00			
609 a	Reflectorised Pavement Stud (Flush Surface Type Single)	EACH	6,000.00			
604 a	Metal Guard Rail	M	5,100.00			
604 b	Guard Rail End pieces	EACH	90.00			
604 d	Steel Post for Guard Rail	EACH	1,700.00			
Total:						


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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [TIRCH ROAD FROM NISHKO BRIDGE TO SHAHGROOM TIRCH]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 6d (CLEARANCE OF SNOWFALL)						
SIW-6-1	Removal of Snowfall Till end of Defect Liability and cost will paid as per The Engineer Directive.	L/S	32,620,000.00			32,620,000.00
Total:						32,620,000.00


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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [TIRCH ROAD FROM NISHKO BRIDGE TO SHAHGROOM TIRCH]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 7 (GENERAL ITEMS)						
7.1	Provision of Engineering Testing Laboratory Equipment + Purchasing of Vehicles for Resident Engineers, Assistant Resident Engineers and Support Staffs including Registration, POL, Maintenance and Salaries of Drivers, Utility bills	PS	168,409,037.80	1.00		168,409,037.80
Total:						168,409,037.80


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GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

**PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN
DISTRICT CHITRAL [02-LOTS]**

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS
[02-ROADS OF 42.30 KM LENGTH], DISTRICT CHITRAL [RECH ROAD]**

SUMMARY OF BILLS

S NO	DESCRIPTION	TOTAL AMOUNT IN FIGURES (RS)
1	BILL NO: 1 EARTH WORK	
2	BILL NO: 2 ROAD WORK (SUB-BASE, BASE AND SURFACE COURSE)	
3	BILL NO: 3 CULVERTS AND CAUSEWAYS	
4	BILL NO: 4 RETAINING WALLS AND BREAST WALL	
5	BILL NO: 4a CONSTRUCTION OF RCC BRIDGES	
6	BILL NO: 5 DRAINAGE AND ANTI EROSION WORK	
7	BILL NO: 6 ANCILLARY WORKS	
8	BILL NO: 6d CLEARANCE OF SNOWFALL	13,980,000.00
TOTAL AMOUNT OF CIVIL WORK:		
TOTAL AMOUNT OF CIVIL WORK IN MILLIONS:		

Project Director (PIU)
Provincial Road Improvement Project
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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [RECH ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL NO: 1 EARTH WORK						
101	Clearing and Grubbing.	SM	21,648.00			
104	Compaction of Natural Ground.	SM	21,648.00			
108a	Formation of Embankment from Road way excavation in common material	CM	8,868.34			
108b (iii)	Formation of Embankment from Roadway excavation in Soft Rock Material	CM	5,912.22			
106a / 106c	Excavate Unsuitable Common Material	CM	28,956.42			
106b (i)	Excavate Unsuitable Hard Rock Material Unclassified	CM	7,239.10			
106b (ii)	Excavate Unsuitable Medium Rock Material Unclassified	CM	14,478.21			
106b (iii)	Excavate Unsuitable Soft Rock Material Unclassified	CM	21,717.31			
109a	Subgrade preparation in Earth Cut	SM	29,766.00			
Total:						


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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [RECH ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 2 ROAD WORK (SUB-BASE, BASE AND SURFACE COURSE)						
201	Granular Sub Base	CM	11,071.00			
401a2 ii	Concrete Class A2 (ON GROUND)	CM	12,485.00			
310.2.3	Providing and laying Polythene sheet heavy weight under rigid pavement including overlapping, wastage and cortage etc.complete as per drawing.	SM	60,270.00			
SIW-15 406a	Premoulded Joint Filler 20 mm Thick with Bitumastic joint seal	M	12,300.00			
Total:						


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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [RECH ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 3 (CULVERTS AND CAUSEWAYS)						
107a	Structural Excavation in Common Material.	CM	1,063.00			
401f	Lean Concrete	CM	271.00			
401 a3ii	Concrete Class A3 (On ground)	CM	1,588.00			
404b	Reinforcement as per AASHTO M 31 Grade 60	Ton	174.52			
507 b	Rock Fill in Gabions	CM	7,395.00			
SIW-17 507 a	Steel Wire Mesh for Gabion	SM	10,200.00			
501d	R.C.C. Pipe Culvert AASHTO M 170 Class II Dia 610 mm	M	150.00			
501f	R.C.C. Pipe Culvert AASHTO M 170 Class II Dia 910 mm	M	60.00			
502 b	Concrete Class B in Bedding and Encasement of Concrete Pipe Culvert.	CM	551.00			
SIW-13	Providing and filling sand behind abutment of culverts and causeways	CM	2,887.00			
Total:						


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PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [RECH ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 4 (RETAINING WALLS AND TOE WALLS)						
107a	Structural Excavation in Common Material.	CM	16,433.00			
107e	Common Backfill	CM	3,916.00			
401b	Concrete Class B	CM	2,659.00			
401a1 (ii)	Concrete Class A1 (ON GROUND)	CM	305.00			
401f	Lean Concrete	CM	3,632.00			
SIW-8 401h	Plum Concrete (Class 'B' with 40% Boulders/ Rock) as per drawing & Engineer's Instructions	CM	36,952.00			
Total:						


Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [RECH ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 4a (CONSTRUCTION OF RCC BRIDGES)						
407i	Pile Load Tests to 2 times the design load	Each	2.00			
SIW 7 (Item 407)	Exploratory/Confirmatory Boring and Soil testing, including soil investigation report					
SIW 7 a	Exploratory/Confirmatory Boring	M	60.00			
SIW 7 b	Soil testing, / investigation report	L.Sum	2.00			
407d	Cast-in-place, Reinforced Concrete Cylindrical Piles dia 1200 mm	M	650.00			
107a	Structural Excavation in Common Material.	CM	762.30			
401f	Lean Concrete	CM	67.31			
401a3 (i)	Concrete Class 'A 3' (UNDER GROUND)	CM	292.99			
401a3 (ii)	Concrete Class 'A 3' (ON GROUND)	CM	195.33			
404b	Reinforcement as per AASHTO M 31 Grade 60	Ton	231.30			
SIW-13	Providing and filling sand behind abutment of bridges	CM	2,774.40			
406 e	Elastomeric Bearing Pads & as per approved drawing	Cu.cm	158,400.00			
401 d ii	Concrete Class 'D 2'	CM	196.06			
SIW 4 405b	Launching of Girders in place including lifting, handling and temporary works	M	200.00			
SIW-5	Galvanized Iron Drain Pipe, 75 mm Diameter	Each	52.00			
401a3 (iii)	Concrete Class 'A 3' (ELEVATED)	CM	218.08			
SIW 12 406c	Supply and place in position expansion joint assemblies as specified & as per approved drawing	M	37.20			
SIW 4 405a	Prestressing High Tensile Steel Including Sheathing, Anchorage, Assemblies, Grouting and Stressing Complete in All Respect	KG	8,524.80			
SIW-6	PVC Pipe sched. 40 200 mm Dia. for Services.	M	260.00			
Total:						

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [RECH ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 5 (DRAINAGE AND ANTI EROSION WORK)						
107a	Structural Excavation in Common Material.	CM	4,406.00			
107e	Common Backfill	CM	2,558.00			
401b	Concrete Class B	CM	3,131.00			
401a1ii	Concrete Class A1 (ON GROUND)	CM	158.00			
404 b	Reinforcement as per AASHTO M 31 Grade 60	Ton	16.12			
507 b	Rock Fill in Gabions	CM	18,270.00			
SIW-17 507 a	Steel Wire Mesh for Gabion	SM	31,500.00			
401f	Lean Concrete	CM	1,395.00			
Total:						


Project Director (PIU)
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GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [RECH ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 6 (ANCILLARY WORKS)						
610 c	Kilometer Post	EACH	10.00			
607 a	Traffic Road Signs Category 1 Size 75 CM	EACH	6.00			
607 b	Traffic Road Signs Category 2 Size dia 75 CM	EACH	3.00			
607c	Traffic Road Signs Category 3 (a)	EACH	2.00			
607 d	Traffic Road Signs Category 3 (b)	EACH	2.00			
608 h	Pavement Marking in reflective TP paint for line of 15 cm width.	M	21,210.00			
609 a	Reflectorised Pavement Stud (Flush Surface Type Single)	EACH	2,020.00			
604 a	Metal Guard Rail	M	2,100.00			
604 b	Guard Rail End pieces	EACH	30.00			
604 d	Steel Post for Guard Rail	EACH	700.00			
Total:						


Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE 7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-1: REHABILITATION AND IMPROVEMENT OF RURAL ACCESS AND FLOOD AFFECTED ROADS [02-ROADS OF 42.30 KM LENGTH],
DISTRICT CHITRAL [RECH ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 6d (CLEARANCE OF SNOWFALL)						
SIW-6-1	Removal of Snowfall Till end of Defect Liability and cost will paid as per The Engineer Directive.	L/S	13,980,000.00			13,980,000.00
Total:						13,980,000.00


Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

KPRRDP/OCB/CW-07

**PACKAGE-7: REHABILITATION AND IMPROVEMENT OF
FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT
CHITRAL IO2-LOTSI**

LOT-2

**REHABILITATION AND IMPROVEMENT OF
FLOOD AFFECTED AND TOURISM ROADS IO2-
ROADS OF 37.30 KM LENGTHI, DISTRICT
CHITRAL**


Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA


KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL

SUMMARY OF BILLS

S/NO	DESCRIPTION	TOTAL AMOUNT CHT-9	TOTAL AMOUNT UCH-NR-1	TOTAL AMOUNT IN FIGURES (RS)
1	BILL NO: 1 EARTH WORK			
2	BILL NO: 2 ROAD WORK (SUB-BASE, BASE AND SURFACE COURSE)			
3	BILL NO: 3 CULVERTS AND CAUSEWAYS			
4	BILL NO: 4 RETAINING WALLS AND BREAST WALL			
5	BILL NO: 4a CONSTRUCTION OF RCC BRIDGES			
6	BILL NO: 5 DRAINAGE AND ANTI EROSION WORK			
7	BILL NO: 6 ANCILLARY WORKS			
8	BILL NO: 6a REST AREA			
9	BILL NO: 6b WALKING TRACK AND STRAIRS			
10	BILL NO: 6d CLEARANCE OF SNOWFALL	19,805,000.00	23,300,000.00	43,105,000.00
TOTAL AMOUNT OF CIVIL WORK:				
TOTAL AMOUNT OF CIVIL WORK IN MILLIONS:				


Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH], DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]

SUMMARY OF BILLS

S NO	DESCRIPTION	TOTAL AMOUNT IN FIGURES (RS)
1	BILL NO: 1 EARTH WORK	
2	BILL NO: 2 ROAD WORK (SUB-BASE, BASE AND SURFACE COURSE)	
3	BILL NO: 3 CULVERTS AND CAUSEWAYS	
4	BILL NO: 4 RETAINING WALLS AND BREAST WALL	
5	BILL NO: 4a CONSTRUCTION OF RCC BRIDGES	
6	BILL NO: 5 DRAINAGE AND ANTI EROSION WORK	
7	BILL NO: 6 ANCILLARY WORKS	
8	BILL NO: 6a REST AREA	
9	BILL NO: 6b WALKING TRACK AND STRAIRS	
10	BILL NO: 6d CLEARANCE OF SNOWFALL	19,805,000.00
TOTAL AMOUNT OF CIVIL WORK:		
TOTAL AMOUNT OF CIVIL WORK IN MILLIONS:		

Project Director (PIO)
Provincial Road Improvement Project
C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL NO: 1 EARTH WORK						
101	Clearing and Grubbing.	SM	41,382.00			
104	Compaction of Natural Ground.	SM	41,382.00			
108a	Formation of Embankment from Road way excavation in common material	CM	67,883.78			
108b (iii)	Formation of Embankment from Roadway excavation in Soft Rock Material	CM	45,255.85			
106a / 106c	Excavate Unsuitable Common Material	CM	23,403.63			
106b (i)	Excavate Unsuitable Hard Rock Material Unclassified	CM	13,915.67			
106b (ii)	Excavate Unsuitable Medium Rock Material Unclassified	CM	13,283.14			
106b (iii)	Excavate Unsuitable Soft Rock Material Unclassified	CM	12,650.61			
109a	Subgrade preparation in Earth Cut	SM	65,835.00			
Total:						


Project Director (PIU)
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 C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 2 ROAD WORK (SUB-BASE, BASE AND SURFACE COURSE)						
201	Granular Sub Base	CM	15,419.00			
401a2 ii	Concrete Class A2 (ON GROUND)	CM	17,357.00			
310.2.3	Providing and laying Polythene sheet heavy weight under rigid pavement including overlapping, wastage and cortage etc.complete as per drawing.	SM	83,790.00			
SIW-15 406a	Premoulded Joint Filler 20 mm Thick with Bitumastic joint seal	M	16,758.00			
Total:						


Project Director (PIU)
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GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 3 (CULVERTS AND CAUSEWAYS)						
107a	Structural Excavation in Common Material.	CM	1,701.00			
401f	Lean Concrete	CM	406.00			
401 a3ii	Concrete Class A3 (On ground)	CM	2,371.00			
404b	Reinforcement as per AASHTO M 31 Grade 60	Ton	260.57			
507 b	Rock Fill in Gabions	CM	7,830.00			
SIW-17 507 a	Steel Wire Mesh for Gabion	SM	13,500.00			
501d	R.C.C. Pipe Culvert AASHTO M 170 Class II Dia 610 mm	M	150.00			
501f	R.C.C. Pipe Culvert AASHTO M 170 Class II Dia 910 mm	M	60.00			
502 b	Concrete Class B in Bedding and Encasement of Concrete Pipe Culvert.	CM	265.00			
SIW-13	Providing and filling sand behind abutment of culverts and causeways	CM	4,382.00			
Total:						


Project Director (PIU)
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GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 4 (RETAINING WALLS AND TOE WALLS)						
107a	Structural Excavation in Common Material.	CM	22,779.00			
107e	Common Backfill	CM	5,376.00			
401b	Concrete Class B	CM	3,693.00			
401a1 (ii)	Concrete Class A1 (ON GROUND)	CM	204.00			
401f	Lean Concrete	CM	4,974.00			
SIW-8 401h	Plum Concrete (Class 'B' with 40% Boulders/ Rock) as per drawing & Engineer's Instructions	CM	53,396.00			
Total:						


Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 4a (CONSTRUCTION OF RCC BRIDGES)						
407i	Pile Load Tests to 2 times the design load	Each	4.00			
SIW 7 (Item 407)	Exploratory/Confirmatory Boring and Soil testing, including soil investigation report					
SIW 7 a	Exploratory/Confirmatory Boring	M	150.00			
SIW 7 b	Soil testing, / investigation report	L.Sum	4.00			
407d	Cast-in-place, Reinforced Concrete Cylindrical Piles dia 1200 mm	M	1,450.00			
107a	Structural Excavation in Common Material.	CM	1,876.88			
401f	Lean Concrete	CM	319.33			
401a3 (i)	Concrete Class 'A 3' (UNDER GROUND)	CM	1,139.90			
401a3 (ii)	Concrete Class 'A 3' (ON GROUND)	CM	759.93			
404b	Reinforcement as per AASHTO M 31 Grade 60	Ton	598.20			
SIW-13	Providing and filling sand behind abutment of bridges	CM	5,548.80			
407-7(b)	Supply and Fabrication of Permanent Lining	Kg	14,465.85			
SIW-13	Providing and filling sand behind abutment of culverts and causeways	CM	561.00			
406 e	Elastomeric Bearing Pads & as per approved drawing	Cu.cm	396,000.00			
401 d ii	Concrete Class 'D 2'	CM	445.28			
SIW 4 405b	Launching of Girders in place including lifting, handling and temporary works	M	540.00			
SIW-5	Galvanized Iron Drain Pipe, 75 mm Diameter	Each	100.00			
401a3 (iii)	Concrete Class 'A 3' (ELEVATED)	CM	498.96			
SIW 12 406c	Supply and place in position expansion joint assemblies as specified & as per approved drawing	M	83.70			
SIW 4 405a	Prestressing High Tensile Steel Including Sheathing, Anchorage, Assemblies, Grouting and Stressing Complete in All Respect	KG	18,001.54			
SIW-6	PVC Pipe sched. 40 200 mm Dia. for Services.	M	1,080.00			
Total:						

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 5 (DRAINAGE AND ANTI EROSION WORK)						
107a	Structural Excavation in Common Material.	CM	4,109.00			
107e	Common Backfill	CM	3,383.00			
401b	Concrete Class B	CM	3,828.00			
401alii	Concrete Class A1 (ON GROUND)	CM	90.00			
404 b	Reinforcement as per AASHTO M 31 Grade 60	Ton	14.13			
507 b	Rock Fill in Gabions	CM	16,530.00			
SIW-17 507 a	Steel Wire Mesh for Gabion	SM	28,500.00			
401f	Lean Concrete	CM	1,440.00			
Total:						


Project Director (PIU)
 Provincial Road Improvement Project
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GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 6 (ANCILLARY WORKS)						
610 c	Kilometer Post	EACH	17.00			
607 a	Traffic Road Signs Category 1 Size 75 CM	EACH	8.00			
607 b	Traffic Road Signs Category 2 Size dia 75 CM	EACH	4.00			
607c	Traffic Road Signs Category 3 (a)	EACH	4.00			
607 d	Traffic Road Signs Category 3 (b)	EACH	2.00			
608 h	Pavement Marking in reflective TP paint for line of 15 cm width.	M	35,910.00			
609 a	Reflectorised Pavement Stud (Flush Surface Type Single)	EACH	3,420.00			
604 a	Metal Guard Rail	M	6,600.00			
604 b	Guard Rail End pieces	EACH	80.00			
604 d	Steel Post for Guard Rail	EACH	2,200.00			
Total:						


Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 6b (REST AREA)						
P.S	Building Works	SM	3,882.00			
P.S	Pavement Work	SM	2,500.00			
Total:						


Project Director (PIU)
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 C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL NO: 6b WALKING TRACK AND STRAIRS						
101	Clearing and Grubbing.	SM	800.00			
104	Compaction of Natural Ground.	SM	800.00			
108a	Formation of Embankment from Road way excavation in common material	CM	1,284.00			
106a / 106c	Excavate Unsuitable Common Material	CM	642.00			
106b (i)	Excavate Unsuitable Hard Rock Material Unclassified	CM	1,155.60			
106b (ii)	Excavate Unsuitable Medium Rock Material Unclassified	CM	770.40			
SIW 14 (Item 511)	Grouted Stone Pitching (C.S. 1:6)	CM	2,400.00			
SIW-8 401h	Plum Concrete (Class 'B' with 40% Boulders/ Rock) as per drawing & Engineer's Instructions	CM	405.00			
401b	Concrete Class B	CM	324.00			
401a1ii	Concrete Class A1 (ON GROUND)	CM	576.00			
411g	Roll Pointing on Stone Work	SM	1,440.00			
109a	Subgrade preparation in Earth Cut	SM	2,400.00			
Total:						


Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [PASHTY ROAD, PRET TO PASHTY VALLEY]

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 6d (CLEARANCE OF SNOWFALL)						
SIW-6-1	Removal of Snowfall Till end of Defect Liability and cost will paid as per The Engineer Directive.	L/S	19,805,000.00			19,805,000.00
Total:						19,805,000.00


Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH], DISTRICT CHITRAL [OVEER ROAD]

SUMMARY OF BILLS

S/NO	DESCRIPTION	TOTAL AMOUNT IN FIGURES (RS)
1	BILL NO: 1 EARTH WORK	
2	BILL NO: 2 ROAD WORK (SUB-BASE, BASE AND SURFACE COURSE)	
3	BILL NO: 3 CULVERTS AND CAUSEWAYS	
4	BILL NO: 4 RETAINING WALLS AND BREAST WALL	
5	BILL NO: 4a CONSTRUCTION OF RCC BRIDGES	
6	BILL NO: 5 DRAINAGE AND ANTI EROSION WORK	
7	BILL NO: 6 ANCILLARY WORKS	
8	BILL NO: 6d CLEARANCE OF SNOWFALL	23,300,000.00
TOTAL AMOUNT OF CIVIL WORK:		
TOTAL AMOUNT OF CIVIL WORK IN MILLIONS:		

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GOVERNMENT OF KHYBER PAKHTUNKHWA

KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [OVEER ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL NO: 1 EARTH WORK						
101	Clearing and Grubbing.	SM	33,330.00			-
104	Compaction of Natural Ground.	SM	33,330.00			-
108a	Formation of Embankment from Road way excavation in common material	CM	21,281.86			-
108b (iii)	Formation of Embankment from Roadway excavation in Soft Rock Material	CM	14,187.91			-
106a / 106c	Excavate Unsuitable Common Material	CM	105,422.72			-
106b (i)	Excavate Unsuitable Hard Rock Material Unclassified	CM	39,533.52			-
106b (ii)	Excavate Unsuitable Medium Rock Material Unclassified	CM	44,804.66			-
106b (iii)	Excavate Unsuitable Soft Rock Material Unclassified	CM	73,795.91			-
109a	Subgrade preparation in Earth Cut	SM	48,884.00			-
Total:						-


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DISTRICT CHITRAL [OVEER ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ		
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words
BILL # 2 ROAD WORK (SUB-BASE, BASE AND SURFACE COURSE)					
201	Granular Sub Base	CM	17,071.00		-
401a2 ii	Concrete Class A2 (ON GROUND)	CM	20,307.00		-
310.2.3	Providing and laying Polythene sheet heavy weight under rigid pavement including overlapping, wastage and cortage etc.complete as per drawing.	SM	98,980.00		-
SIW-15 406a	Premoulded Joint Filler 20 mm Thick with Bitumastic joint seal	M	9,898.00		-
Total:					-


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DISTRICT CHITRAL [OVEER ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 3 (CULVERTS AND CAUSEWAYS)						
107a	Structural Excavation in Common Material.	CM	1,361.00			-
401f	Lean Concrete	CM	349.00			-
401 a3ii	Concrete Class A3 (On ground)	CM	2,181.00			-
404b	Reinforcement as per AASHTO M 31 Grade 60	Ton	256.81			-
507 b	Rock Fill in Gabions	CM	5,220.00			-
SIW-17 507 a	Steel Wire Mesh for Gabion	SM	7,200.00			-
501d	R.C.C. Pipe Culvert AASHTO M 170 Class II Dia 610 mm	M	150.00			-
501f	R.C.C. Pipe Culvert AASHTO M 170 Class II Dia 910 mm	M	60.00			-
502 b	Concrete Class B in Bedding and Encasement of Concrete Pipe Culvert.	CM	551.00			-
SIW-13	Providing and filling sand behind abutment of culverts and causeways	CM	3,728.00			-
					Total:	-


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PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [OVEER ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 4 (RETAINING WALLS AND TOE WALLS)						
107a	Structural Excavation in Common Material.	CM	24,064.00			-
107e	Common Backfill	CM	5,489.00			-
401b	Concrete Class B	CM	3,094.00			-
401a1 (ii)	Concrete Class A1 (ON GROUND)	CM	621.00			-
401f	Lean Concrete	CM	5,214.00			-
SIW-8 401h	Plum Concrete (Class 'B' with 40% Boulders/ Rock) as per drawing & Engineer's Instructions	CM	55,656.00			-
Total:						-


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PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [OVEER ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 4a (CONSTRUCTION OF RCC BRIDGES)						
407i	Pile Load Tests to 2 times the design load	Each	2.00			-
SIW 7 (Item 407)	Exploratory/Confirmatory Boring and Soil testing, including soil investigation report					-
SIW 7 a	Exploratory/Confirmatory Boring	M	60.00			-
SIW 7 b	Soil testing, / investigation report	L.Sum	2.00			-
407d	Cast-in-place, Reinforced Concrete Cylindrical Piles dia 1200 mm	M	710.00			-
107a	Structural Excavation in Common Material.	CM	873.18			-
401f	Lean Concrete	CM	101.48			-
401a3 (i)	Concrete Class 'A 3' (UNDER GROUND)	CM	500.57			-
401a3 (ii)	Concrete Class 'A 3' (ON GROUND)	CM	333.71			-
404b	Reinforcement as per AASHTO M 31 Grade 60	Ton	314.23			-
SIW-13	Providing and filling sand behind abutment of bridges	CM	2,774.40			-
406 e	Elastomeric Bearing Pads & as per approved drawing	Cu.cm	158,400.00			-
401 d ii	Concrete Class 'D 2'	CM	98.03			-
SIW 4 405b	Launching of Girders in place including lifting, handling and temporary works	M	120.00			-
SIW-5	Galvanized Iron Drain Pipe, 75 mm Diameter	Each	40.00			-
401a3 (iii)	Concrete Class 'A 3' (ELEVATED)	CM	266.83			-
SIW 12 406c	Supply and place in position expansion joint assemblies as specified & as per approved drawing	M	37.20			-
SIW 4 405a	Prestressing High Tensile Steel Including Sheathing, Anchorages, Assemblies, Grouting and Stressing Complete in All Respect	KG	4,844.93			-
SIW-6	PVC Pipe sched. 40 200 mm Dia. for Services.	M	280.00			-
Total:						-

GOVERNMENT OF KHYBER PAKHTUNKHWA

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PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [OVEER ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	Total Amount (Rs) in Figures
BILL # 5 (DRAINAGE AND ANTI EROSION WORK)						
107a	Structural Excavation in Common Material.	CM	4,505.00			-
107e	Common Backfill	CM	4,043.00			-
401b	Concrete Class B	CM	5,717.00			-
401a1ii	Concrete Class A1 (ON GROUND)	CM	90.00			-
404 b	Reinforcement as per AASHTO M 31 Grade 60	Ton	9.18			-
507 b	Rock Fill in Gabions	CM	16,530.00			-
SIW-17 507 a	Steel Wire Mesh for Gabion	SM	28,500.00			-
401f	Lean Concrete	CM	3,780.00			-
Total:						-


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PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [OVEER ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 6 (ANCILLARY WORKS)						
610 c	Kilometer Post	EACH	20.00			-
607 a	Traffic Road Signs Category 1 Size 75 CM	EACH	12.00			-
607 b	Traffic Road Signs Category 2 Size dia 75 CM	EACH	8.00			-
607c	Traffic Road Signs Category 3 (a)	EACH	6.00			-
607 d	Traffic Road Signs Category 3 (b)	EACH	4.00			-
608 h	Pavement Marking in reflective TP paint for line of 15 cm width.	M	42,420.00			-
609 a	Reflectorised Pavement Stud (Flush Surface Type Single)	EACH	4,040.00			-
604 a	Metal Guard Rail	M	6,000.00			-
604 b	Guard Rail End pieces	EACH	60.00			-
604 d	Steel Post for Guard Rail	EACH	2,000.00			-
Total:						-


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KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT (KP-RRDP)

PACKAGE-7: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT CHITRAL [02-LOTS]

**LOT-2: REHABILITATION AND IMPROVEMENT OF FLOOD AFFECTED AND TOURISM ROADS [02-ROADS OF 37.30 KM LENGTH],
DISTRICT CHITRAL [OVEER ROAD]**

BILLS OF QUANTITIES

NHA Specification Item No.	DESCRIPTION	Unit	BOQ			Total Amount (Rs) in Figures
			QTY	Unit Rate (Rs) in Figures	Unit Rate (Rs) in Words	
BILL # 6d (CLEARANCE OF SNOWFALL)						
SIW-6-1	Removal of Snowfall Till end of Defect Liability and cost will paid as per The Engineer Directive.	L/S	23,300,000.00			23,300,000.00
Total:						23,300,000.00


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KPRRDP/OCB/CW-07

**PACKAGE-7: REHABILITATION AND IMPROVEMENT OF
FLOOD AFFECTED AND TOURISM ROADS IN DISTRICT
CHITRAL IO2-LOTS1**

ANNEXURE – C
**INITIAL ENVIRONMENTAL
EXAMINATION (IEE)**


Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

Initial Environmental Examination

PUBLIC

Project number: 54048-001
July 2024

Pakistan: Khyber Pakhtunkhwa Rural Roads Development Project

Prepared by Communication and Works Department of Khyber Pakhtunkhwa for the Asian Development Bank (ADB).

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Provincial Road Improvement Project
C&W Department Peshawar



GOVERNMENT OF KHYBER PAKHTUNKHWA
COMMUNICATION & WORKS DEPARTMENT
Provincial Road Improvement Project (PRIP) (ADB Assisted)
Tele: # 091-5700649 / 091-9216123-, E-mail: pdprpp.pkha@gmail.com
House # 24/C-3, Circular Road University Town Peshawar.

No. **12265 / 23 / PRIP**

Dated: **02 /08/2024**

To

Mr. Khurram Ghafoor,
Senior Project Officer (Infrastructure),
ADB Pak Resident Mission,
Level 8, Serena Business Complex G-5 Islamabad.

Subject: **KHYBER PAKHTUNKHWA RURAL ROADS DEVELOPMENT PROJECT**

Sub-Head **INITIAL ENVIRONMENTAL EXAMINATION (IEE) REPORT**

Enclosed please find herewith a final Initial Environmental Examination Report (IEE) pertaining to Khyber Pakhtunkhwa Rural Roads Development Project, for further necessary action please.

PROJECT DIRECTOR (PIU) - PRIP
C&W Department Peshawar.

Copy for information to the:

1. PS to Secretary to Government of Khyber Pakhtunkhwa C & W Department, Peshawar
2. Project Accountant, PRIP, C&W Department, Peshawar

PROJECT DIRECTOR (PIU) - PRIP
C&W Department Peshawar.

Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

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LIST OF ACRONYMS

AD	Assistant Director
ADB	Asian Development Bank
ADP	Annual Development Program
AIT	Asian Institute of Technology
BAP	Borrow Pit Action Plan
BOQ	Bill of Quantities
C&WD	Communication & Works Department
CHA	Critical Habitat Assessment
CR	Critically Endangered
CSC	Construction Supervision Consultant
CTMP	Construction Traffic Management Plan
DD	Deputy Director
EA	Environmental Approval
EIA	Environmental Impact Assessment
EMP	Environment Management Plan
EN	Endangered
EO	Environmental Officer
EPA	Environment Protection Agency
ESSU	Environment & Social Safeguard Unit
FD	Forest Department
FGDs	Focus Group Discussions
GFPs	Grievance Focal Points
GoKP	Government of Khyber Pakhtunkhwa
GoP	Government of Pakistan
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
IBAT	Integrated Biodiversity Assessment Tool
IEE	Initial Environment Examination
IUCN	International Union for Conservation of Environment
Km	Kilometer
KP	Khyber Pakhtunkhwa
LAA	Land Acquisition Act (of 1984)
LARP	Land Acquisition and Resettlement Plan
MSL	Mean Sea Level
NCS	National Conservation Strategy
NEQS	National Environmental Quality Standards
NEQS	National Environmental Quality Standards
NGOs	Non-Governmental Organizations
NT	Near Threatened
NTFP	Non-Timber Forest Products
O&M	Operation and Maintenance
PD	Project Director
PIU	Project Implementation Unit
PKHA	Pakhtunkhwa Highways Authority
PKR	Pakistani Rupee
PMU	Project Management Unit
PRRP	Provincial Roads Rehabilitation Project
RCC	Reinforced Cement Concrete
REA	Rapid Environmental Assessment
ROW	Right of Way
SFA	Social Framework Agreement
SOP	Standard Operational Procedures
SPS	Safeguard Policy Statement
STD	Sexually Transmitted Diseases

SSEMP	Site Specific Environmental Management Plan
VOC	Vehicle Operating Cost
VU	Vulnerable
WAPDA	Water and Power Development Authority
WWF	World Wildlife Fund

Executive Summary

Introduction

1. This document presents the Initial Environmental Examination (IEE) regarding the rehabilitation works of 89 roads and 32 bridges and its construction related activities in various districts of Khyber Pakhtunkhwa (KP). The main theme of the project is to enhance the accessibility to Education, Health, and Market Facilities along with serving of maximum population. These 89 roads can further divide in three types of roads such as (i) access road (ii) tourism roads and (ii) flood affected roads. The rehabilitation works are planned on all these roads within the av Introduction
2. This document presents the Initial Environmental Examination (IEE) regarding the rehabilitation works of 89 roads and 32 bridges and its construction related activities in various districts of Khyber Pakhtunkhwa (KP). The main theme of the project is to enhance the accessibility to Education, Health, and Market Facilities along with serving of maximum population. These 89 roads can further divide in three types of roads such as (i) access road (ii) tourism roads and (ii) flood affected roads. The rehabilitation works are planned on all these roads within the available right of way.
3. Total 37 roads have been selected in access roads category, which are spread in various districts of KP, such as 04 roads in Bannu, 02 roads in Battagram, 03 roads in Bunner, 02 roads in Charsada, 01 road each in Chiral, Karak and Torgarh, 03 roads in Dir lower, 02 roads in Kohat, 05 roads in Malakand and 13 roads in Shangla. Total 19 roads have been selected for tourism category, which are spread in various districts of KP, such as 01 roads each in Buner, Chitral and Swabi, 02 roads each in Dir upper and lower, 03 roads each in Haripur and Mansehra, and 06 roads in Swat. Total 33 roads have been selected in flood affected category, which are spread in various districts of KP, such as 05 roads in Chitral, 16 roads in DI. Khan, 01 road in Dir lower, 03 roads in Dir upper, 03 roads in Karak, 04 in Kohistan Upper and 01 in Kohistan lower. Total of the 32 bridges have been selected for rehabilitation works in Battagram, Buner, Dir Lower, Dir Upper, Karak, Kohat, Kohistan, Mansehra, Karak, Mansehra, Mardan, Nowshera, Peshawar, Shangla, Swabi, Swat, Lower Chitral and Charsada of KP. Among 32, the rehabilitation of RCC is involved in 13 number of bridges while 19 number of bridges will be of prefabricated steel bridges.

Project Activities

4. The bridges and road's rehabilitation works in terms of formation width or construction limits, the project's corridor of impact (COI) is thus strictly limited to the existing and available width of carriageway and within the government owned official right of way (RoW). However, for the purpose of environmental assessment 250 m distance on each side from center line of the roads and bridges was selected as COI.
5. Currently, the available right of way is 18m to 23m (variable for all roads) which is not fully black topped, shoulders are not available and road conditions are not up to the national or international design (AASHTO) criteria. The required ROW will be 22.5m for the rehabilitation and improvement of the proposed roads. In short for all roads rehabilitation the existing ROW will be fully utilized. Where required the retaining wall will be provided. A minimum of 1km to a maximum of 5.25km retaining wall will be constructed at various RDs along the project roads. Provision of drains (a minimum of 10 to maximum of 24 drain at various RDs) along the roads. Culverts and box culverts of varying sizes and various locations along the roads. Road furniture and signage (including furniture/signs, better slopes, landscaping, guardrails, and crash barriers, etc.), 4-5 to 6.5m (variable) carriage

way (asphalt top) along the road of the project, 1m to 2m (variable) PCC shoulder on each side at various locations. Retaining wall for embankment heights greater than 3 m to check the erosion of embankment by the rains or failure of the slopes due to scouring or otherwise. Guard rail for embankment heights greater than 3 m. The proposed thickness of Rigid Pavement Concrete is 250 mm while Subbase thickness will be 150 mm in rehabilitation works.

6. The project is categorized as category 'B' in accordance with ADB Safeguard Policy Statement (SPS) 2009 due to its relatively low potential for adverse environmental impacts. These impacts are mostly site-specific and can generally be minimized through mitigation measures.

Key Findings

7. This IEE has established that, except for the residual impacts mentioned below, there are no significant environmental issues that cannot be either totally prevented or adequately mitigated to levels acceptable to the national and international standards for Project activities.
8. The key identified residual impacts are as follows:
 - Climate change - Even with the incorporation of the proposed design measures it is still possible that the roads could be impacted by extreme precipitation events and high temperatures. In the short term the design measures should ensure that the significance of impacts is reduced to low, but in the longer term more extreme climate events could have greater impacts on the roads.
 - Landslides - Slope protection measures and including of suitably graded slopes during the design phase should help ensure that residual impact of landslides during the operational phase will be low.
 - Soil erosion – Should be largely mitigated during construction, but there could be occasions where heavy rainfall events induce erosion on newly cut slopes.
 - Encroachment into Nationally Designated Sites - Prohibiting siting of camps, haul routes, etc, in nationally protected areas would ensure that residual impacts to these areas are generally avoided. However, there still remains the risk of access to sites being increased during the operational phase due to the upgraded roads. Residual impact significance should however, be low as any change in traffic levels is not anticipated to be highly significant.
 - Impacts to Internationally Designated Sites – Three roads are located within Palas Valley and one within Kayal Valley, both of which are Important Bird Areas (IBA) Designated for the Protection of the Western Tragopan (IUCN – Vulnerable). Palas Valley is thought to contain a significant population of the Tragopan (approximately 330, out of a global population estimated at 3,500), and it is possible that the valley could be classified as potential critical habitat for this species. However, the Tragopan is generally found at elevations ranging between 1,750 and 3,600 meters above sea level (masl). Two other endangered species inhabit the Palas Valley: the Himalayan Musk Deer (*Moschus leucogaster*), which typically inhabits elevations ranging from 2,500 to 5,000 masl, preferring forested and alpine habitats, and the Snow Leopard, which inhabits

higher altitudes (above 3,000 masl). All three proposed roads are located at elevations ranging from 630 masl up to 1,260 masl, below the general habitat range of the Tragopan and other endangered species (Himalayan Musk Deer and Snow Leopard). Accordingly impacts on these species are considered unlikely. One road is located in the adjacent Kayal Valley, also designated as an IBA due to the potential presence of the Tragopan. However, the population numbers of the bird are not known to be as high in this vally as in Palas, and therefore it is unlikely to be a potential critical habitat for this species. Nonetheless, this IEE contains specific requirements for the prohibition of ancillary facilities, borrow pits, haul routes, etc within higher elevations in these valleys and for strict controls on poaching by project workers.

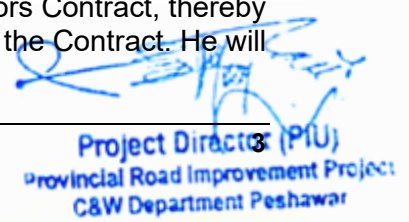
- Impacts to other special status species – avoidance of fish spawning periods and working in periods of low river flow should help reduce the potential risk of impacts to special status fish. Further, surveys of all bridge sites and development and implementation of management plans for turtles, should ensure that risks to endangered and critically endangered species are largely avoided.
- The work on bridges with seasonal flow will start during the dry season to avoid impacts on fish (24 of 32 bridges belong to this group). For the remaining 8 bridges, the contractor will consult with the relevant local environmental protection department.
- Dust – vehicle movements and ground works will generate dust, which cannot be entirely eliminated. Residual impacts will however be very low as long as the required mitigation measures are implemented.
- Accidents – involving workers and the community cannot be entirely ruled out. However, the IEE includes a wide range of management measures for these topics.
- Operational phase noise and air quality impacts are not anticipated to significantly increase above the current ambient levels.

Consultations

9. The stakeholder consultations have been carried out by meeting stakeholders to obtain overall feedback about the project and its potential impacts. Consultations have also been carried out through elderly village leaders and also with the general public of the project area. All consultations were carried out in accordance with the ‘meaningful consultation’ guidelines of ADB’s SPS 2009 and their outcome is discussed in the section 8 of this IEE report

Implementation

10. The EMP, its mitigation and monitoring programs, contained herewith will be included within the Bidding documents for project works. The Bid documents state that the Contractor will be responsible for the implementation of the requirements of the EMP (including specific design phase actions) through his own CEMP which will adopt all of the conditions of the EMP and add site specific elements that are not currently known. This ensures that all potential bidders are aware of the environmental requirements of the Project and its associated environmental costs.
11. The EMP and all its requirements will then be added to the Contractors Contract, thereby making implementation of the EMP a legal requirement according to the Contract. He will



Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

then prepare his CEMP which will be approved and monitored by the CSC. Should the SC note any non-conformance with the CEMP (and the EMP) the Contractor can be held liable for breach of the contractual obligations of the EMP. To ensure compliance with the CEMP the Contractor should employ an Environmental and Social Manager to monitor and report Project activities throughout the Project Construction phase.

1 Introduction

1.1 General

12. This document presents the Initial Environmental Examination (IEE) including the environmental management plan of about 89 roads with total length of 941.95km rural roads network and 32 bridges in the Khyber Pakhtunkhwa (KP), province of Pakistan. The rural roads networks in KP have a critical role in accessing the basic facilities including health, education, market and connecting the rural communities to the district centers and with the whole province in general, while the bridges play vital roles in connecting the communities and roads selected in the project.

1.2 Project Overview

13. The Government of Khyber Pakhtunkhwa agreed to received loan from the Asian Development Bank (ADB) towards the cost of the Khyber Pakhtunkhwa Provincial Roads Improvement Project (Loan 3601/3602-PAK). Communication and Works Department decided to prepare feasibility study for Rural Roads Network of 941.95km and 32 numbers of bridges. For the additional works adjustments in the cost and scope of work in the Construction Supervision Consultancy Contract have been made with the condition that the scope for the Main Contract “Construction Supervision of Khyber Pakhtunkhwa Provincial Roads Improvement Project” and timing will not be affected by this additional task of KP-RRDP. Both assignments will go simultaneously and separately. After the finalization of the feasibility and approval from the quarter concerned the detail engineering design of the roads and bridges have been finalized based on which the IEE report has been prepared.
14. The Communication and Works Department (C&WD) of Khyber Pakhtunkhwa will be the Implementation Agency of the Project and Project Implementation Unit (PIU) has been established headed by a Project Director (Client's Representative).

1.3 KP Accessibility Index

15. **Geo-Spatial Analysis** at the tehsil level for the whole of KP shows results for the ‘Accessibility Index’ of Education (figure 1-1), road density (figure 1-2), Health (figure 1-3), and Markets (figure 1-4) clearly shows that overall Northern and Southern Districts have low accessibility to such facilities in comparison to central districts, but still in central districts roads connecting the rural roads in KP have a critical role in accessing basic facilities including health, education, markets, and connecting rural communities to the district centers and the rest of the province.
16. Urban centers need an upgrade in most cases. This argument can be further strengthened by the fact that 90% of the Province’s Population lives within two hours of the distance from the urban centers.
17. It is evident from the Road Density Map (figure 1-2) that only four districts show a density greater than 0.55 km per square km area of the district, whereas, the Northern and Southern Districts show a very low density of ≤ 0.20 , and the majority of the Central Districts falls between 0.20 to 0.55 km/sq.km which is still not sufficient enough according to International Standards of accessibility requirement.

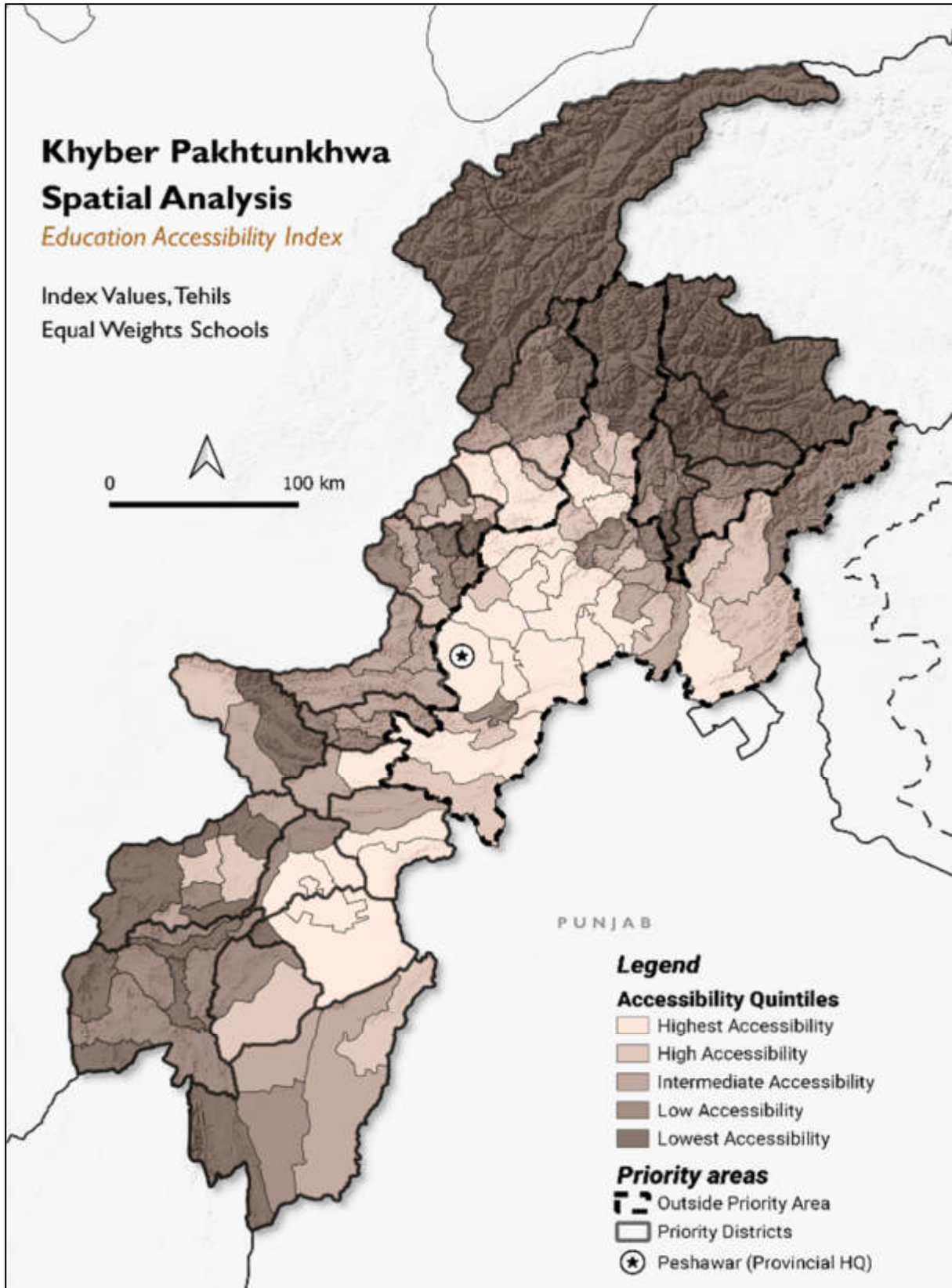


Figure 1-1: Khyber Pakhtunkhwa Education Accessibility Index

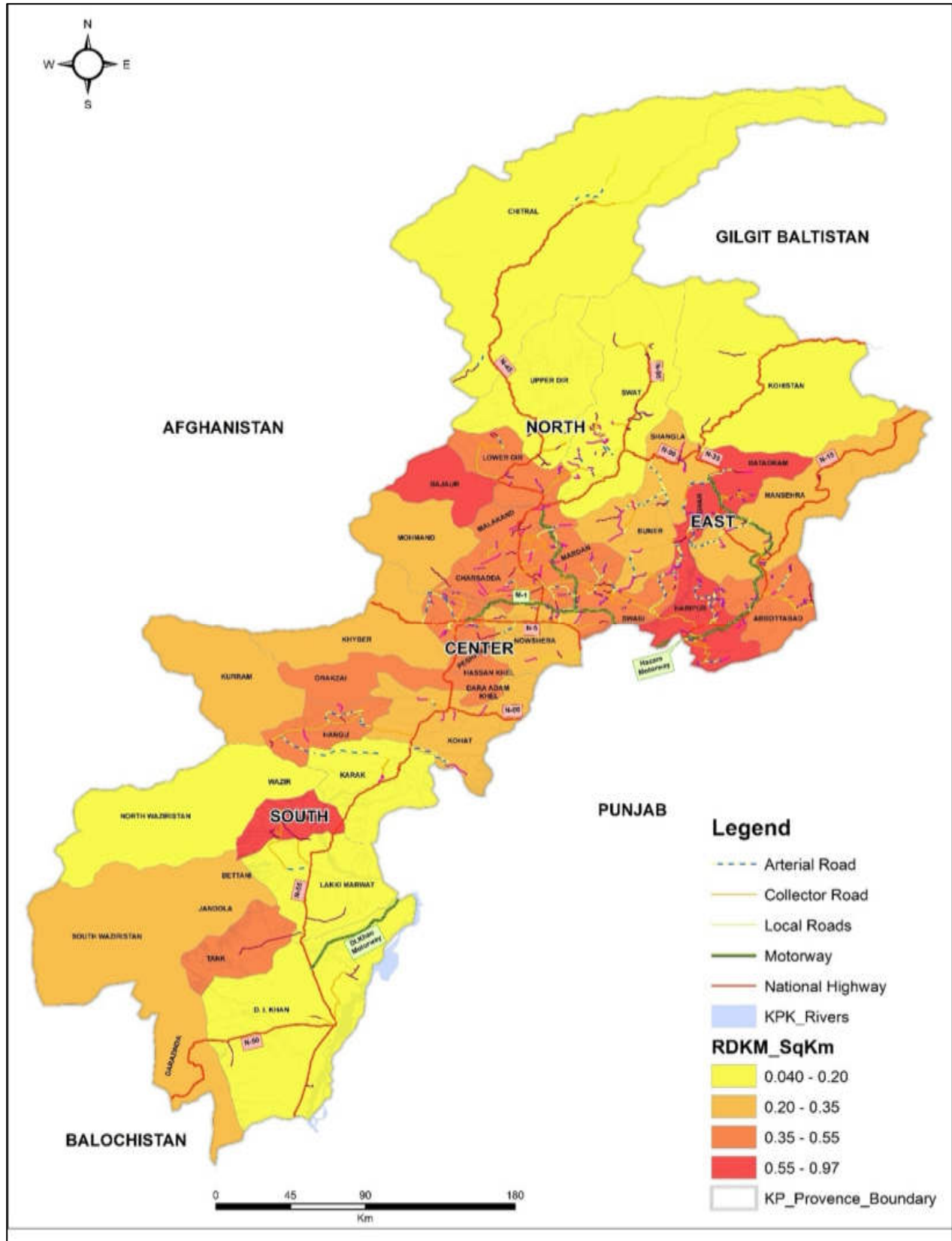


Figure 1-2: Khyber Pakhtunkhwa Road Density Map

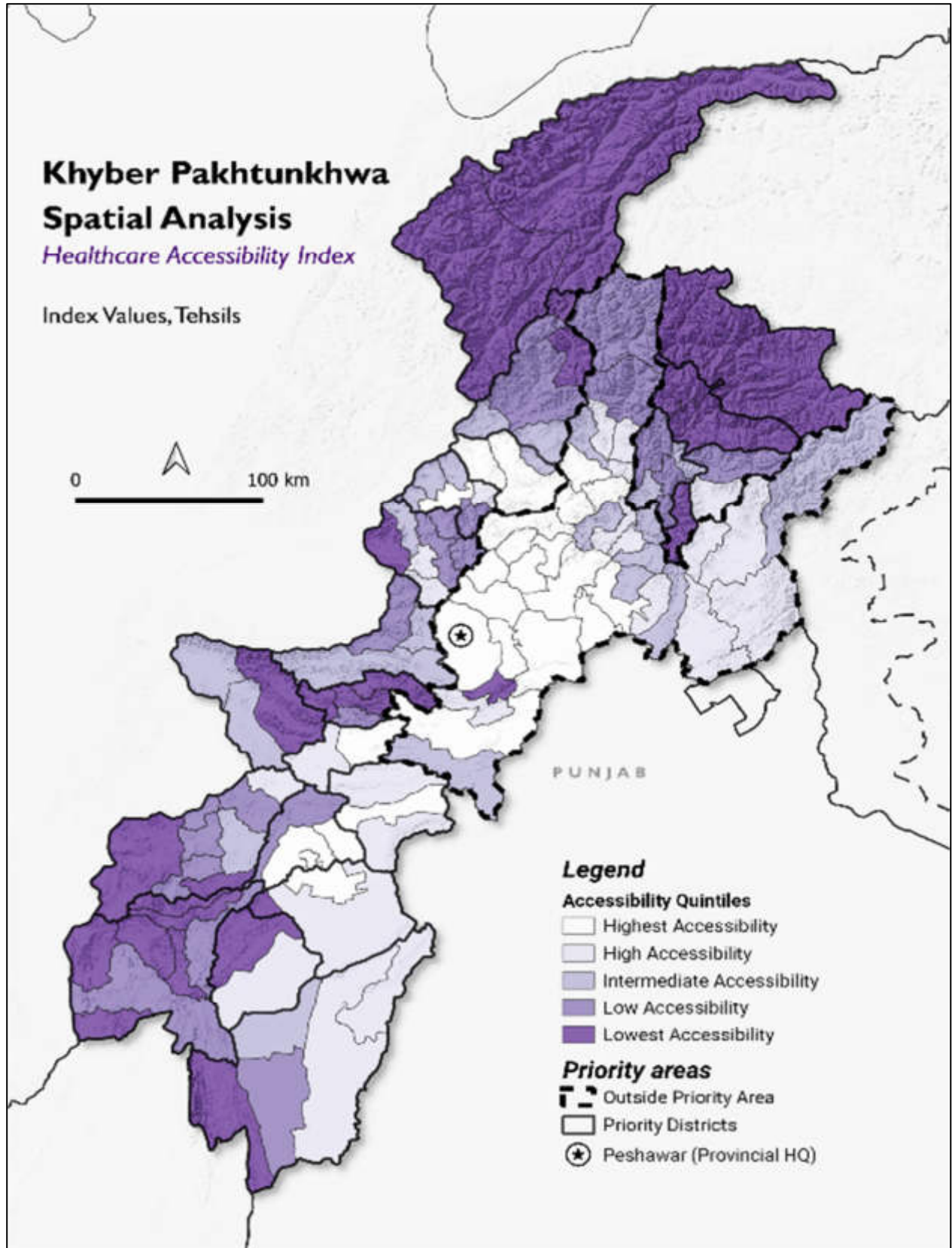


Figure 1-3: Khyber Pakhtunkhwa Healthcare Accessibility Index

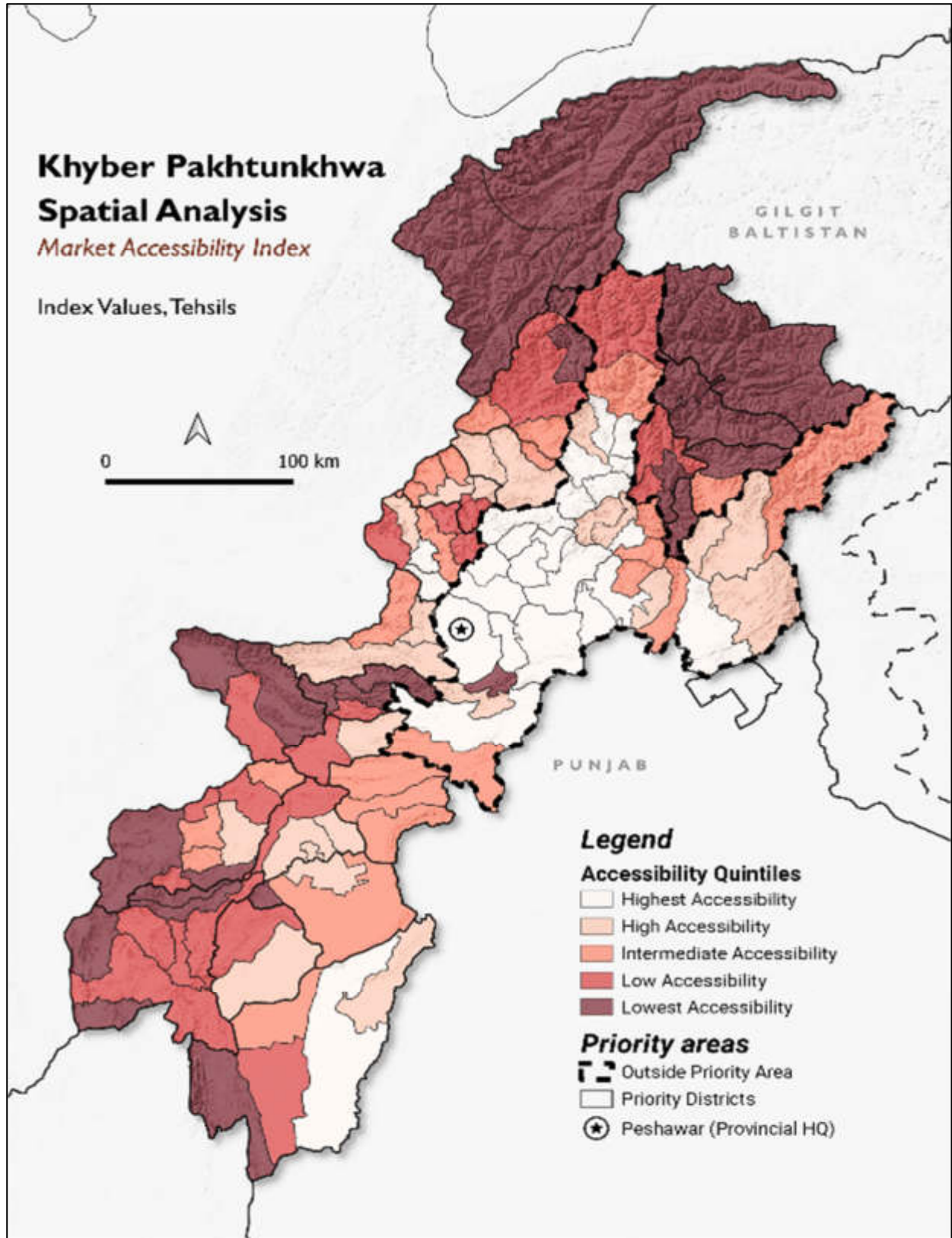


Figure 1-4: Khyber Pakhtunkhwa Market Accessibility Index

18. Geo-Spatial Analysis showed that almost 40% of the rural population in the province must travel more than 01-hour to access a health facility (2nd Highest in the Country). This also has poor access to primary, middle, and secondary schools (figure 1-3). 85% of the rural population must travel more than 30 minutes to access a primary school, whereas, in the case of middle and secondary schools, the percentage is between 90% to 92% respectively figure 1-3.
19. About 85% of the population in Khyber Pakhtunkhwa lives in rural areas, whereas access to Public Service is not only poor but also deteriorating. Basic services provision in the province lags national averages, partly due to the region’s geographic characteristics that make service delivery a challenge. For instance, northern, and southern Districts in the province face severe service delivery challenges in contrast to Central Districts.

1.4 Project Need

20. Khyber Pakhtunkhwa (KP) is the second poorest and least urbanized province of Pakistan, with urban-rural disparities that have impacted access to education, health and markets. About 80 percent of the population resides in rural areas, where forestry and agriculture are the major economic activities. Almost 40 percent of the rural population in the province have to travel more than one hour to access a health facility, 80 percent of the rural KP population require more than 30 minutes of driving distance to primary schools, and 90 percent of the population of the province lives within two hours distance from an urban centre especially in the newly merged districts (NMDs). Low accessibility has a direct effect on the mortality rate, student enrolment and quality of agri-produce reaching markets. Further accessibility analysis shows that accessibility gaps are more pronounced in southern district of the KP province.
21. The KP province has a rural road network of 21,679 km worth US\$ 2.4 Billion, which is being managed by the Communications & Works (C&W) Department. About 72% of this network is spread over 25-established districts serving 30 million inhabitants while 28% of it is in the 13 Merged Districts serving 5 million inhabitants. Almost, 41% of the total road network is under poor condition, an additional 30% is expected to move from fair to poor condition if not timely maintained¹. The districts in the north and south have a higher proportion of roads under fair – poor condition. However, almost 19% of the entire network is still unpaved which in general has a higher requirement for rehabilitation and periodic maintenance. C&W Department allocated road maintenance and rehabilitation budget over the last 5 years was \$93 million against the actual requirement of \$500-600 million. This allocated budget is insufficient for financing maintenance works. As a result, maintenance is either carried out on small road sections or deferred leading to complete deterioration. The absence of spot and routine maintenance makes certain strategic roads inaccessible during weather calamities. Limited maintenance of the network resulted in progressive deterioration and if further continued would lead to rendering 67% of the entire network in poor condition and depreciation of assets by \$274 million. Poor network condition also poses safety hazards to the commuters and has a direct impact on transport and trade costs. Disparity in the travel time to access education facilities between various districts of the province correlates to the fact that some of the districts lack the required all-weather roads, have poor surface existing roads, and inadequate transport services i.e., School buses. Students In these districts generally have to walk or rely on private vehicles to access their schools. In addition, KPK Northern Area is called the ‘Switzerland’ of Pakistan having huge potential for International and National Level Tourism. However,

¹ C&W RAMS Study, 2013



most such Tourism Spots have issues with proper access/connectivity. World Bank is already executing a project with the title "KITE" under C&W to enhance such Tourism Level Connectivity. This project is also deemed to include some key projects in the Tourism Sector as well having no overlapping with KITE Project.

22. Therefore, this project is a dire need of the province at the moment to scientifically select the road network to enhance overall accessibility to Education, Health, and Markets as well as reduce the maintenance backlog on the C&W up to some extent. As, priority will be given to more accessible and fairer and poor condition roads which can ultimately save the complete deterioration of such roads before time, and results in huge savings overall. Rural roads in KP have a critical role in accessing basic facilities including health, education, markets, and connecting rural communities to the district centers and the rest of the province². The Khyber Pakhtunkhwa Rural Road Development Project (KPRRD), the project will improve access to education, health and market in district centres of KP and create synergies to improve intra-inter village connectivity. It will improve rural roads including farm to markets and will increase economic opportunities, increase in human development due to access to education, health, etc. for the unattended/deprived districts of KP. The road's rehabilitation and improvement works are an integral part of the KPRRD.

1.5 Project Objectives

23. The following are the broad objectives of the KP RRD;
- a) Improve rural accessibility to markets, education, and health facilities through up-gradation of infrastructure and improvement of transport services levels in the province.
 - b) Interventions under the project would address the funding gap for infrastructure maintenance, development, and transport services;
 - c) Providing improved and all-weather connectivity help in linking farm to markets thus creating job opportunities and improving the capacity of respective departments (C&W and PKHA) to respond to local needs.
 - d) Improved network and connectivity under the project would help in unlocking the economic and development opportunities for inhabitants of the province through safer transportation, agriculture, and rural transformation, and reduce the income gap between urban and rural residents.
 - e) Timely maintenance and up-gradation of rural roads and bridges through informed decision-making would also enhance asset life and optimize the utilization of the province's budget.
 - f) To promote the local tourism by providing the easy access through roads.

1.6 Multi-Criteria Analysis ('MCA') Methodology Application

24. Multi-criteria analysis (MCA) technique was employed in short listing of roads and bridges keeping in view the following five points.
1. Define the Decision (Goal)
 2. Identify the client's interests with opinions (preferences)
 3. Build a Decision Framework showing alternatives

² <https://projects.worldbank.org/en/projects-operations/document-detail/P177069?type=projects>

4. Evaluation criteria (interests)
5. Outcomes or consequences associated with alternative/interest combination.

1.6.1 Aim of conducting MCA

25. MCA provides a systematic approach for supporting complex decisions according to pre-determined criteria and objectives. MCA is particularly suitable for complex decision problems that involve multiple and conflicting objectives and criteria. It allows for identifying a single preferred alternative or to rank or short-list possible alternatives. MCA provides a framework to explore trade-offs between different options.

1.6.2 Roads and Bridges Selection by District Using Multi-Criteria Analysis ('MCA')

26. Total 941.95km length of roads (89 roads in 20 districts) and 32 bridges was selected for the final detailed design of the project, whereas, to allocate the number of roads kilometres to each district equitably, the technique of MCA was used to do the allocation scientifically without any bias to any particular district. Some of the sub-interests examples are:

1.6.3 Proximity to other facilities

- Maintain distance from community centers
- Be accessible to public parks
- Be accessible to high schools

1.6.4 Proximity to users

- Is easily accessible to existing neighborhoods
- Be easily accessible to planned neighborhoods to be built in the near term.

1.6.5 Ease of access

- From surrounding neighborhoods
- By greenway
- By roadway

1.6.6 Environmental impact

- Minimize disruption to mature trees and vegetation
- Avoid topographic challenges
- Minimize impact on the watershed

1.6.7 Traffic Impact

- New traffic can be accommodated by the existing street network Compatibility with Surrounding Area
- Facility footprint and use must be compatible with the surrounding neighborhood

1.6.8 Visibility and Profile of Facility

- Facility footprint must be compatible with, and not detract from the surrounding neighborhood

1.6.9 Parking

- Tract must be of an appropriate dimension to accommodate parking

1.6.10 Cost

- Reduce on-site development costs
- Reduce off-site development costs

27. As, the main theme of the project is to enhance the accessibility to Education, Health, and Market Facilities along with serving of maximum population. The other objective of the road’s rehabilitation was increasing the tourism in the KP province through easy access. Therefore, the following main criteria along with their respective weights were selected in consultation with all stakeholders as given in table 1.1.

Table 1-1: Criteria along with their respective weights for roads selection

#	Criteria	% Age
1	Health	25
2	Education	25
3	Road Density	15
4	Build Up Area Density Female	5
5	Build Up Area Density Male	5
6	Gross Population Density	5
7	District Budget Allocation	5
8	Presence of Tourist Spot	10
Total		100

28. A list of short list roads and bridges is given in a table 1.3 (access roads), 1.4 (tourism roads), 1.5 (flood affected roads) while all bridges are given in table 1.5.

1.7 Location and Types of the Roads and Bridges

29. Total of 89 roads and 32 bridges have been selected for the rehabilitation works in Khyber Pakhtunkhwa. These 89 roads can further divide in three types of roads such as (i) access road (ii) Tourism roads and (ii) Flood affected roads. The overall project is further divided into 13 lots construction packages comprising of roads and bridges.
30. The rehabilitation works are planned on all these roads within the available right of way. The overall roads distribution is listed in table 1.2 while figure 1-1 depicts the overall distribution of roads and bridge in KP.

Table 1-2: Roads Number and Types

#	Road Types	Number
1	Access Roads	37
2	Tourism roads	19
3	Floods affected	33
Total number		89
Total Bridges		32

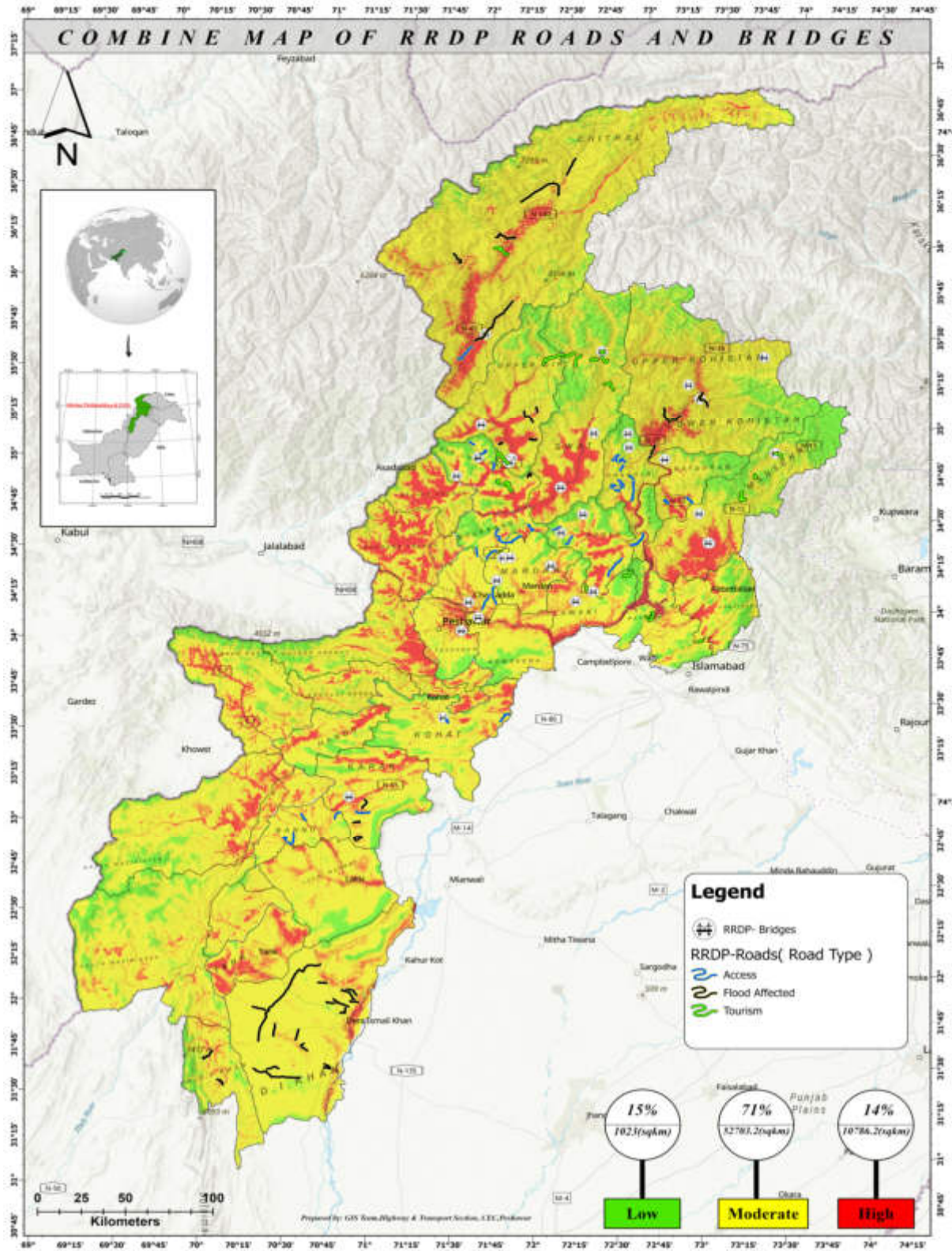


Figure 1-5: Location Zones of Roads and Bridges

1.7.1 Access Roads

31. Total 37 roads have been selected in access roads category, which are spread in various districts of KP, such as 04 roads in Bannu, 02 roads in Battagram, 03 roads in Bunner, 02 roads in Charsada, 01 road each in Chiral, Karak and Torgarh, 03 roads in Dir lower, 02 roads in Kohat, 05 roads in Malakand and 13 roads in Shangla.
32. The details of assess road category along with their respective lengths are list in table 1.3, while figure 1-2 shows the locations of the access roads.

Table 1-3: List of Access Roads and their total length

Access Roads		
Sr. No.	Road ID and Name	Road Length (km)
Bannu		
1	BN-3: Rehabilitation of Alla Khel to Havid Road in Bannu	5.20
2	BN-5: Rehabilitation of Durrani Chowk to Piran Titter Khel Road in Bannu	5.30
3	N-BN-1: Rehabilitation of Alla Khel to Mir Sher Khan Chowk via Havid Road in Bannu	11.3
4	N-BN-11: Reconstruction of Village Waligai Uc Zaraki Pirba Khel Road in Bannu	6.30
Battagram		
5	BTG-16: Rehabilitation of Rajdari to Kathora Road I/C Link Road in Battagram	8.10
6	BTG-2: Rehabilitation of road Kandar to Sokar Chilar in Battagram	7.6
Bunner		
7	N-BUN-2: Rehabilitation of Bababir to Manga Thana to Nagarai Road in Bunner	18.8
8	BUN-11: Rehabilitation of Jangdara Bato road in District Bunner	6.8
9	BUN-9: Rehabilitation of Girari road in Bunner	5.10
Charsada		
10	CHR-9: Rehabilitation of Takhtbhai Road to Malang Abad in Charsada	11.0
11	CHR-10: Rehabilitation of Road from Sardheri Bazar to Nisata via Zarin Abad in Charsada	10
Chitral		
12	N-CHT-2: Rehabilitation of Osaic to Orsoon road in District Chitral	22.0
Dir Lower		
13	DRL-35: Rehabilitation of Mula Hukam Baba to Sro Gul Khero Shah road in lower Dir.	5.2
14	T-30: Rehabilitation of road to Sar Banda Munjai Top in lower Dir	8.4
15	T-31: Rehabilitation of road to Pantolo Picnic Spot in lower Dir	8.0
Karak		
16	N-KRK-R2: Rehabilitation of road from Takhate Nasrati Bridge to Khadda Banda via Bhogara Culvert Rose Baig Khail Kalah in District Karak	10.00
Kohat		
17	KOHAT-3: Rehabilitation of road from Mukarab Khan Corona to Kot Road in District Kohat	5.5
18	N-KOHAT-3: Rehabilitation of Khusal Garh Road to Kamar Dhoke in District Kohat	9.9
Malakand		
19	CHR-4: Rehabilitation of road from Landi Shah to Narrai Uba in Malakand.	5.2
20	MLK-7: Rehabilitation of road Neher Quarter to Jaban Power House in District Malakand	5.10
21	MLK-4: Rehabilitation of Mura Banda Link road in Malakand	7.10

Access Roads		
Sr. No.	Road ID and Name	Road Length (km)
22	N-MLK-1: Rehabilitation of Daragai-Palai Interchange Swat Motorway in District Malakand	20.00
23	N-MLK-2: Rehabilitation of road from Badranga to Jazoon Dag Road in District Malakand	8.0
Shangla		
24	SNG-14: Rehabilitation of road from Chakesar Nebi More to Said Abad in District Shangla	6.00
25	SNG-61: Rehabilitation of Miankalay Pagorai Kas Road in Shangla	7.80
26	SNG-20: Rehabilitation of Towa Chowkai Asharkot Road in Shangla	8.20
27	SNG-26: Rehabilitation of Aluch Bunirwall Road in Shangla	5.00
28	SNG-28: Rehabilitation of Bengalai Landai Balo Chawak Road in Shangla	6.90
29	SNG-30: Rehabilitation of Dherai Faiza Sondvi Road in Shangla	8.60
30	SNG-27: Rehabilitation of Main Dara in District Shangla	5.00
31	SNG-29: Rehabilitation of Chagum Gumbat Road in District Shangla	5.00
32	SNG-63: Rehabilitation of Alpurai Barkas Kag Road in District Shangla	7.00
33	SNG-22: Rehabilitation of Chagam Alamay Road in District Shangla	5.00
34	SNG-7: Rehabilitation of Martung Chakisar Road in District Shangla	14.90
35	SNG-60: Rehabilitation of Rahimabad Kas Basi Road in District Shangla	8.00
36	SNG-33: Rehabilitation of Zara Road in District Shangla	5.00
Tor Garh		
37	TGH-1: Rehabilitation of Karrak Madakhel to Hasan Zai Road in District Tor Garh	22.10

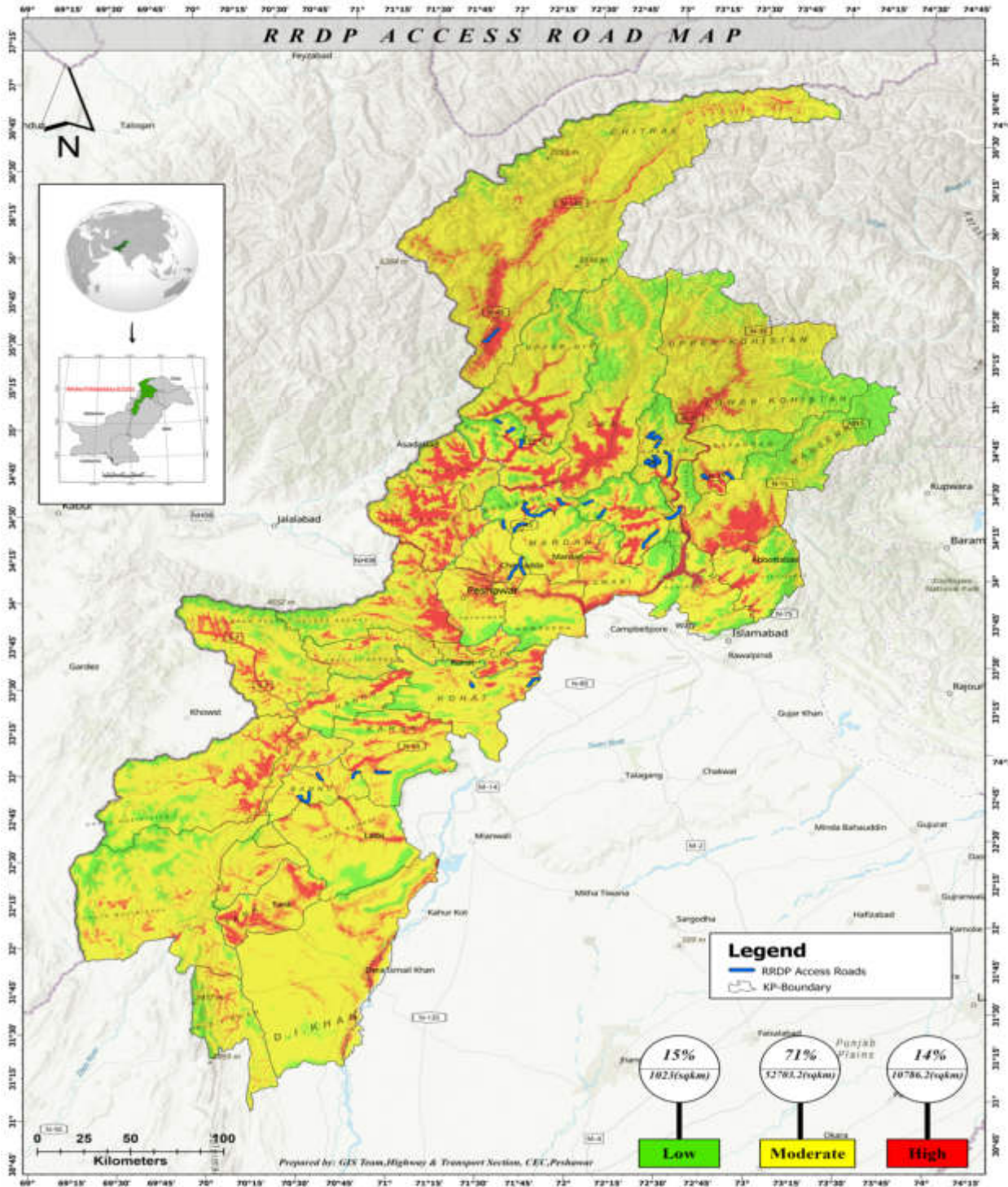


Figure 1-6: Locations Zones of the Access Roads

1.7.2 Tourism Roads

33. Total 19 roads have been selected for tourism category, which are spread in various districts of KP, such as 01 roads each in Buner, Chitral and Swabi, 02 roads each in Dir upper and lower, 03 roads each in Haripur and Mansehra, and 06 roads in Swat. The

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details of tourism roads along with their respective length are list in table 1.4, while figure 1-3 shows locations zones of the tourism roads.

Table 1-4: List of Access Tourism Roads and their Total Length

Tourism Roads		
Sr. No	Road IDs and Name	Length of Road
Bunner		
1	T-1: Rehabilitation of Rani Ghat Road in District Bunner	3.4
Chitral		
2	N-CHT-9: Rehabilitation of Pashty Road, Pret to Pashty Valley in District Chitral	17.1
Dir Lower		
3	DRL-4: Rehabilitation of Ouch Kotigram Local Road in Dir Lower	12.7
4	T-3: Rehabilitation of Road to Laram Top in Dir Lower	5.7
Dir Upper		
5	T-42: Rehabilitation of Road to Sheen Ghar Top in Dir Upper	16.1
6	T-43: Rehabilitation of Road from in Uthror to Thal via Badgoi Top Dir Upper	20.0
Haripur		
7	T-35: Rehabilitation of Nara Akhoonkhail Waterfall Road in Haripur	9.0
8	T-7: Rehabilitation of Noori Water Fall Road in Haripur	5.3
9	HRI-17: Rehabilitation of Anar Gah Road in Haripur	4.1
Mansehra		
10	MAN-2: Rehabilitation of Shingri Road in Mansehra	4.5
11	T-12: Rehabilitation of Road to Saiful Maluk Lake in Mansehra	8.6
12	T-22: Rehabilitation of Road to Sharan Forest in Mansehra	15.3
Swabi		
13	T-2: Rehabilitation of Beer Gali Road in Swabi	9.2
Swat		
14	SWT-5: Rehabilitation of Kalam Banr Shahoo Road in Swat	4.9
15	T-19: Rehabilitation of Beshai Meadows Raod in Swat	6.9
16	T-4: Rehabilitation of Kandol Lake Paristan Lake in Swat	10.6
17	N-SWT-T-2: Rehabilitation of Taip Banda Road in Swat	10.0
18	N-SWT-T4: Rehabilitation of Road from Uthror to Thal via Badgoi Top in Swat.	14.0
19	N-SWT-T3: Rehabilitation of Raod from Desan Meadows to Kalam in Swat	5.0

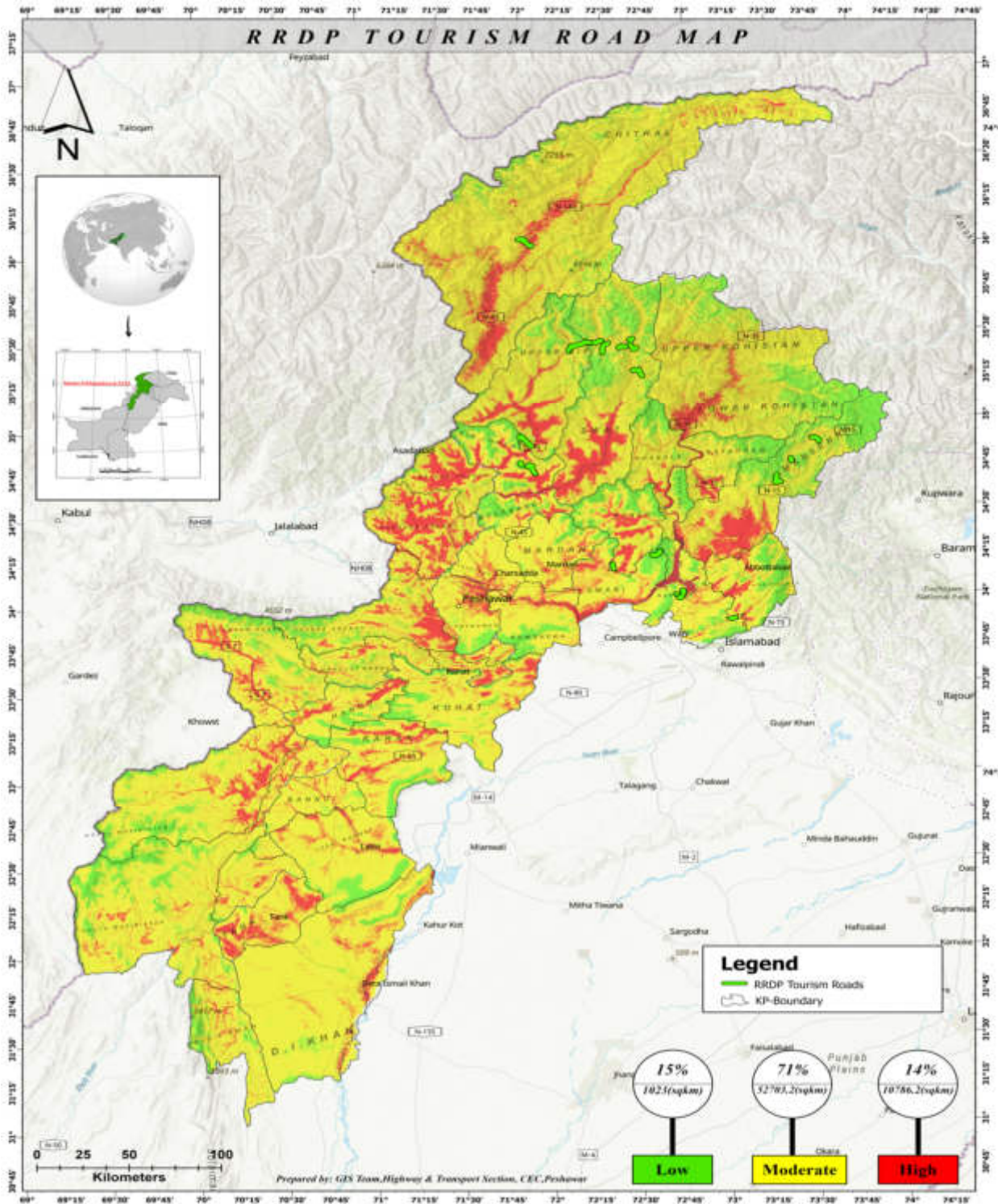


Figure 1-7: Locations Zones of the Tourism Roads

1.7.3 Flood Affected Roads

34. Total 33 roads have been selected in flood affected category, which are spread in various districts of KP, such as 05 roads in Chitral, 16 roads in DI. Khan, 01 road in Dir lower, 03 roads in Dir upper, 03 roads in Karak, 04 in Kohistan Upper and 01 in Kohistan lower. The details of flood affected category along with their respective lengths are list in table 1.5, figure 1-4 shows locations zones of the flood affected roads.

Table 1-5: List of Flood Affected Roads and their total length

#	Road ID and Name	Road Length (km)
Flood Affected Roads		
Chitral		
1	RRD_UCH_NR1: Rehabilitation of Oveer road in Chitral	20.20
2	N-CHT-1: Rehabilitation of Shesha to Madalcasht road in Chitral	41.6
3	N-CHT-5: Rehabilitation of Arkari Valley road in Chitral	10.1
4	N-CHT-6: Rehabilitation of Tirch road from Nishko bridge to Shahgroom Tirch, Chitral	30.0
5	N-CHT-7: Rehabilitation of Rech road in Chitral	12.3
D.I. Khan		
6	KPR_DIK_NR11: Rehabilitation of Main N-50 to Shero Kuhna road in D.I.khan	6.80
7	KPR_DIK_NR13: Main N-55 road to Diyal via Airport and CRBC Colony, D.I. khan	6.10
8	RRD_DIK_R1: Rehabilitation of Prova to Chowdwan road in D.I.khan	29.60
9	RRD_DIK_R2: Rehabilitation of Kulachi to Luni road in D.I.khan	6.20
10	RRD_DIK_R4: Rehabilitation of Mian Kasirai Shareef road (Darazinda) in D.I.khan	10.00
11	RRD_DIK_R6: Rehabilitation of Parwara jalal Khell road (Darazinda) in D.I.Khan	7.30
12	RRD_DIK_R7: Rehabilitation of Main Daraban road to Kot Walidad via Garah Khan	8.00
13	RRD_DIK_NR4: Rehabilitation of Indus highway to Dhok Rabnawaz and Chah Hussain road in D.I.khan	9.10
14	RRD_DIK_NR5: Rehabilitation of Chashma road, Thathal Adda to Phahar pur old Canal road Via Mubarak shah & Thatha in D.I.khan	10.40
15	RRD_DIK_NR6: Rehabilitation of road from Chashma road to village Musa khar and Jabbar wala in D.I.khan	5.10
16	RRD_DIK_NR7: Rehabilitation of Awan Nala Civil Minor road in D.I.khan	10.50
17	RRD_DIK_NR8: Rehabilitation of road from CRBC Canal to Diyal Paharpur Canal road & Rehmat Abad Link in D.I.khan road from	12.60
18	RRD_DIK_NR9: Rehabilitation of Pusha Pul to Garrah Rehman in D.I.khan	5.30

#	Road ID and Name	Road Length (km)
19	RRD_DIK_NR12: Rehabilitation of Jhandi Sewaag Road in D.I.khan	7.50
20	RRD_DIK_NR10: Rehabilitation of Main N-55 road to Sadra Sharif Road in D.I.khan	5.00
21	RRD_DIK_NR14: Rehabilitation of Giloti Road in D.I.khan	68.00
Dir -lower		
22	RRD_DRL_NR1: Rehabilitation of Shorshing Jakra Baba Road	8.00
Dir Upper		
23	RRD_DRU_R1: Link Roads UsheraI Dara	15.40
24	RRD_DRU_NR3: Rehabilitation of Katigram to Shagai U/C Kotke	5.10
25	RRD_DRU_NR4: Rehabilitation of Sundrai to Qadarkandow Road (Nehag Dara)	8.20
Karak		
26	KPR_KRK_NR5: Rehabilitation of Hamdan to Inzar More in Karak	5.80
27	RRD_KRK_R1: Rehabilitation of Indus Highway to Nari Khawar in Karak	7.20
28	RRD_KRK_R3: Rehabilitation of Payala More to Shahidan Banda in Karak	10.40
Kohistan Lower		
29	RRD_LKH_R1: Rehabilitation of Batera Road in Lower Kohistan	10.30
30	RRD_LKH_R2: Rehabilitation Pattan Ziarat Road (Seer Gazi Abad to Kharat) in Lower Kohistan	10.00
31	RRD_LKH_R1: Rehabilitation of Masham Road in Lower Kohistan	5.10
32	RRD_LKH_R4: Rehabilitation of Chawa Darra Road and Renolia Road Tehsil, Bunkat, Ronolia in Lower Kohistan	13.80
Kohistan Upper		
33	RRD_UKH_R1: Rehabilitation of Jalkot Goshali Road 1: Gabber Nullah Road in Upper Kohistan	14.40

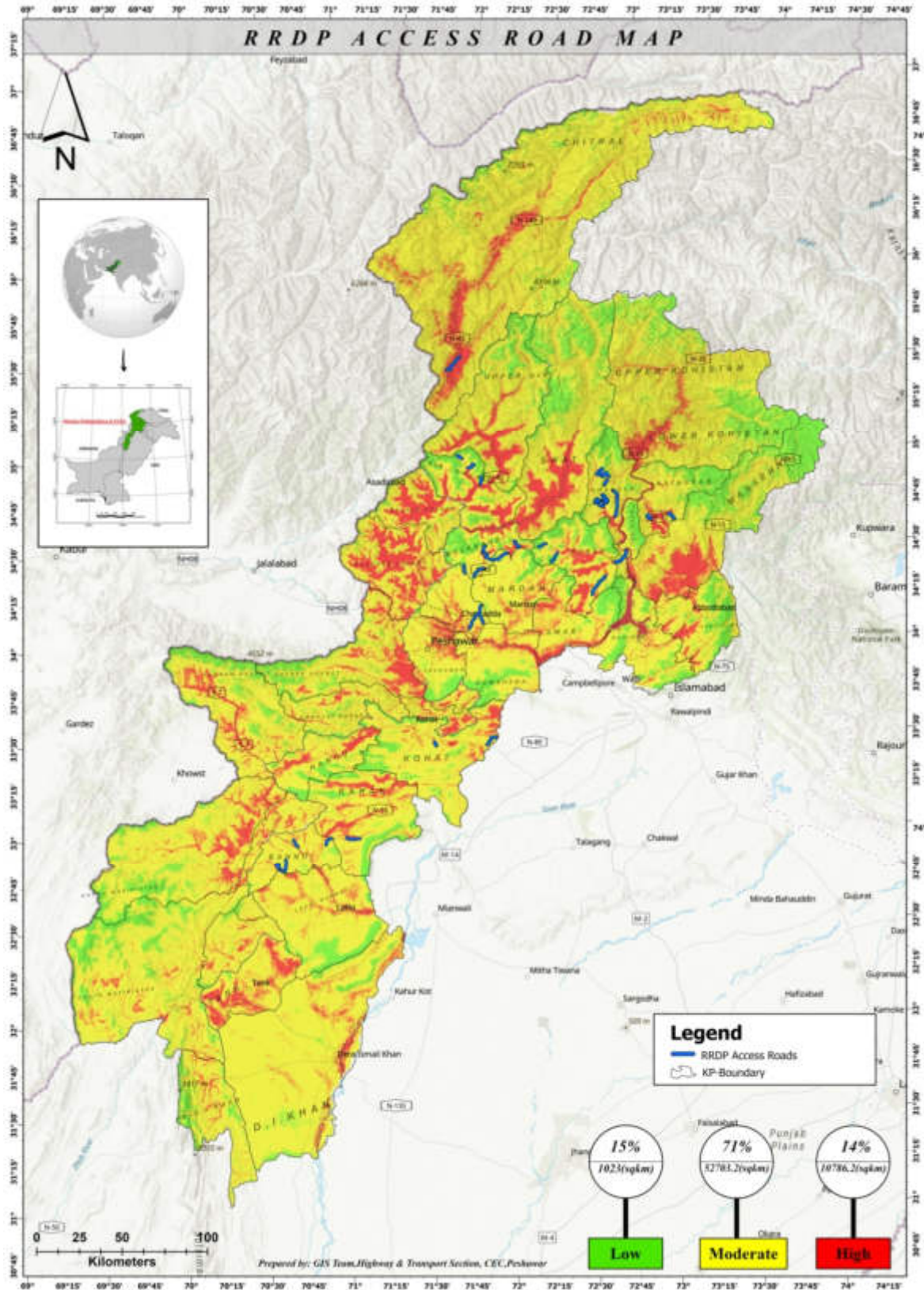


Figure 1-8: Locations Zones of the Flood Affected Roads

1.7.4 Bridges

35. Total of the 32 bridges have been selected for rehabilitation works in Battagram, Buner, Dir Lower, Dir Upper, Karak, Kohat, Kohistan, Mansehra, Karak, Mansehra, Mardan, Noshehra, Peshawar, Shangla, Swabi, Swat, Lower Chitral and Charsadda of KP. Among 32, the rehabilitation of RCC is involved in 13 number of bridges while 19 number of bridges will be of pre-fabricated steel bridges, the details about the bridge are listed in table 1.6.

Table 1-6: List of Flood Affected Roads and their total length

Sr. No.	District	ID	Bridge Name	Total Length in meters (Approx.)
1	Battagram	BTG-BR-4	Kund Banna Road 1 Bridge	30
2	Buner	N-BUN-BR-90	Akhoond Sara Bridge	30
3	Buner	BUN-BR-87	Malil-pur Bridge	60
4	Buner	BUN-BR-89	Baba Sori Bampuhba	60
5	Charsadda	CHR-BR-90	Chuti Bridge	90
6	Dir Lower	DRL-BR-54	Shah Kheli Bridge	20
7	Dir Lower	DRL-BR-61	Shalapalm Bridge	120
8	Dir Lower	DRL-BR-62	Bridge v/c Munda	100
9	Dir Upper	DRU-BR-26	Nangari Bridge	60
10	Dir Upper	DRU-BR-53	Malak Abad Bridge	130
11	Karak	KR-BR-112	Latambar Bridge Kasho	150
12	Kohat	KOHAT-BR-110	Kharmatoo Road Billitang	30
13	Kohistan	KOH-BR-24	Goshali Bridge	35
14	Kohistan	KOH-BR-96	Harban Hurail Bridge	40
15	Kohistan	KOH-BR-111	Seo Eshal Bridge	30
16	Lower Chitral	CHT-BR-1	Jeepable bridge at Gorengole	50
17	Mansehra	MAN-BR-11	Siren bridge	75
18	Mansehra	MAN-BR-27	Malkan Bridge U/C Battal	30
19	Mansehra	MAN-BR-75	Naran Bridge	15
20	Mansehra	MAN-BR-100	Baffa Eidgah Bridge	75
21	Mardan	MRD-BR-69	Pashkando Bridge	30
22	Mardan	MRD-BR-101	Shah Noor Bridge	12
23	Mardan	MRD-BR-102	Chato Bridge	15
24	Mardan	MRD-BR-103	Bridge Over Landay Khwar	75
25	Noshehra	NOW-BR-105	Banda Sheikh Ismail Bridge	25
26	Peshawar	PES-BR-73	Jindi Khwar Bridge	50
27	Shangla	SNG-BR-59	Komalai Bridge	25
28	Shangla	SNG-BR-80	Ganshal Peer Kana	90
29	Swabi	SWB-BR-55	Shomlo Derai Bridge	20
30	Swat	SWT-BR-8	Gula Der Bridge Damage	90
31	Swat	SWT-BR-30	Kula Karin Bridge	20
32	Swat	SWT-BR-106	Shaho Kalam Bridge U/C Kalam	20

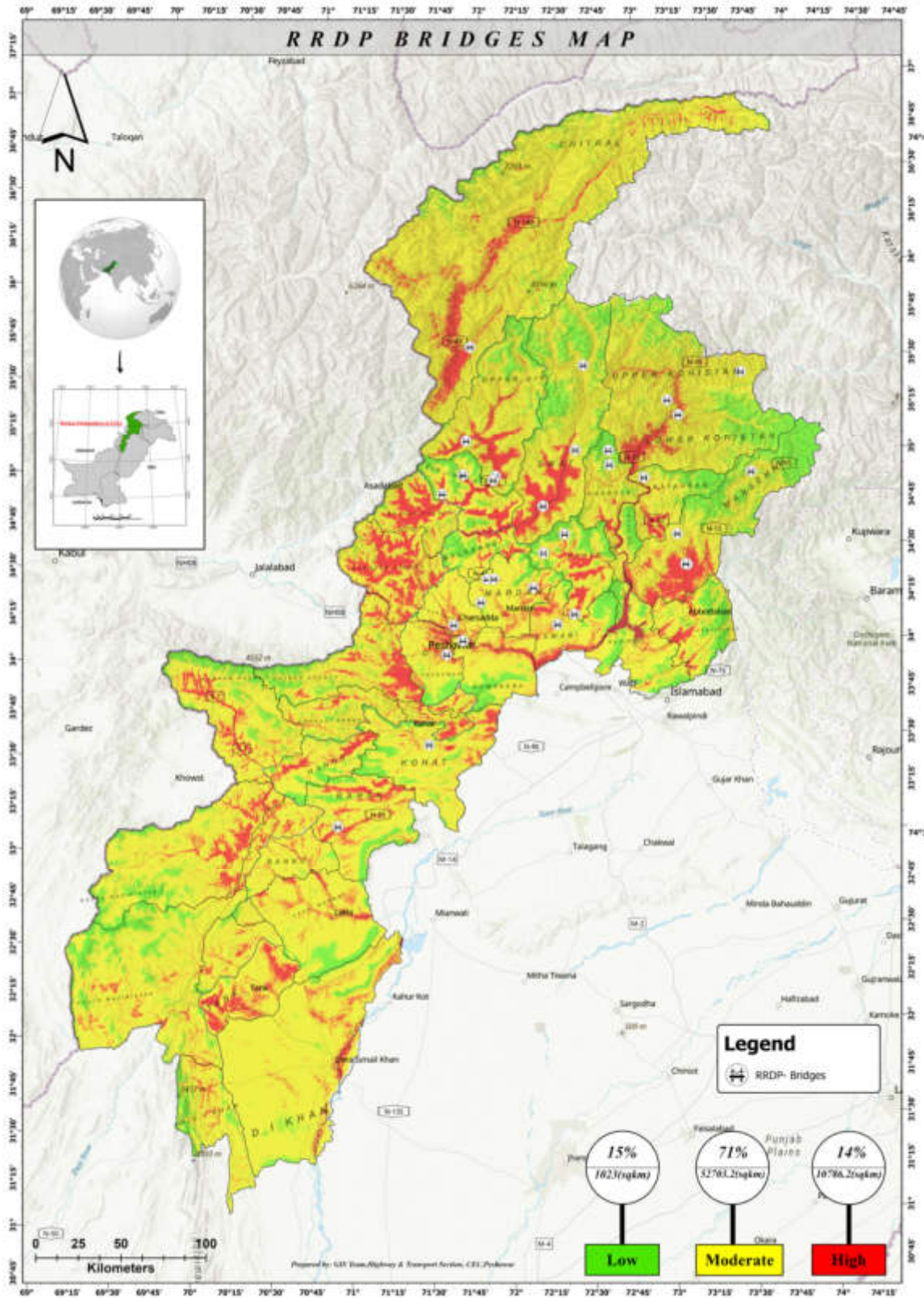



Figure 1-9: Locations Zones of the Bridges

1.7.5 Details of Project Packages

36. The overall project of 89 roads and 32 bridges will further be divided in 13 construction packages, broadly these packages are arranged district wise both for roads and bridges, as listed in in table 1-7.

Table 1-7: Project Packages

S/No	Packages and Sub-Packages	District Name
1	Package-1: Rehabilitation and Improvement of Flood Affected Roads in District DI Khan [02-Lots]	
	Lot-1: Rehabilitation and Improvement of Flood Affected “Giloti” Road, District DI Khan (68.0 Km)	DI Khan
	Lot-2: Rehabilitation and Improvement of Flood Affected Roads [03-Roads of 21.0 Km Length], District DI Khan	DI Khan
2	Package-2: Rehabilitation and Improvement of Flood Affected Roads in District DI Khan [03-Lots]	
	Lot-1: Rehabilitation and Improvement of Flood Affected Roads [07-Roads of 55.0 Km Length], District DI Khan	DI Khan
	Lot-2: Rehabilitation and Improvement of Flood Affected Roads [03-Roads of 46.20 Km Length], District DI Khan	DI Khan
	Lot-3: Rehabilitation and Improvement of Flood Affected Roads [02-Roads of 17.30 Km Length], District DI Khan	DI Khan
3	Package-3: Rehabilitation and Improvement of Rural Access and Flood Affected Roads and RCC Bridges in District Bannu, Karak and Kohat [02-Lots]	
	Lot-1: Rehabilitation and Improvement of Rural Access Roads [04-Roads of 28.10 Km Length], District Bannu	Bannu
	Lot-2: Rehabilitation and Improvement of Rural Access and Flood Affected Roads [06-Roads of 48.80 Km Length], District Karak and District Kohat, and 02-RCC Bridges in District Karak	Karak and Kohat
4	Package-4: Rehabilitation and Improvement of Rural Access Roads and RCC Bridges in District District Charsadda, Malakand, Mardan, Nowshera and Peshawar [02-Lots]	
	Lot-1: Rehabilitation and Improvement of Rural Access Roads [03-Roads of 32.20 Km Length], District Malakand	Malakand
	Lot-2: Rehabilitation and Improvement of Rural Access Roads [04-Roads of 34.20 Km Length], and 07-RCC Bridges in District Charsadda, District Mardan, District Nowshera and District Peshawar	Charsadda, Mardan, Nowshera and Peshawar
5	Package-5: Rehabilitation and Improvement of Rural Access and Tourism Roads and RCC Bridges in District Bunner, District Swabi and District Lower Dir [02-Lots]	
	Lot-1: Rehabilitation and Improvement of Rural Access and Tourism Roads [05-Roads of 43.25 Km Length], and 03-RCC Bridges in District Bunner and District Swabi	Bunner and Swabi
	Lot-2: Rehabilitation and Improvement of Rural Access, Flood Affected, and Tourism Roads [06-Roads of 48.03 Km Length], District Lower Dir	Lower Dir
6	Package-6: Rehabilitation and Improvement of Flood Affected and Tourism Roads in District Dir Upper and Swat [03-Lots]	
	Lot-1: Rehabilitation and Improvement of Flood Affected and Tourism Road [04-Roads of 44.82 Km Length], District Dir Upper	Dir Upper
	Lot-2: Rehabilitation and Improvement of Tourism Roads [02-Roads of 34.00 Km Length], District Upper Dir and District Swat	Upper Dir and District Swat
	Lot-3: Rehabilitation and Improvement of Tourism Roads [05-Roads of 37.37 Km Length], District Swat	Swat



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S/No	Packages and Sub-Packages	District Name
7	Package-7: Rehabilitation and Improvement of Flood Affected and Tourism Roads in District Chitral [02-Lots]	
	Lot-1: Rehabilitation and Improvement of Rural Access and Flood Affected Roads [02-Roads of 42.30 Km Length], District Chitral	Chitral
	Lot-2: Rehabilitation and Improvement of Flood Affected and Tourism Roads [02-Roads of 37.30 Km Length], District Chitral	Chitral
8	Package-8: Rehabilitation and Improvement of Rural Access and Flood Affected Roads in District Chitral [03-Lots]	
	Lot-1: Rehabilitation and Improvement of Flood Affected "Arkari Valley" Road [10.10 Km Length], District Chitral	Chitral
	Lot-2: Rehabilitation and Improvement of Rural Access and Flood Affected "Osaic to Orsoon" Road [22.00 Km Length], District Chitral	Chitral
	Lot-3: Rehabilitation and Improvement of Flood Affected "Shesha to Madalcasht" Road [41.60 Km Length], District Chitral	Chitral
9	Package-9: Rehabilitation and Improvement of Rural Access Roads in District Shangla [02-Lots]	
	Lot-1: Rehabilitation and Improvement of Rural Access Roads [04-Roads of 27.80 Km Length], District Shangla	Shangla
	Lot-2: Rehabilitation and Improvement of Rural Access Roads [09-Roads of 64.60 Km Length], District Shangla	Shangla
10	Package-10: Rehabilitation and Improvement of Flood Affected Roads [05-Roads of 53.60 Km Length], District Lower and Upper Kohistan	
11	Package-11: Rehabilitation and Improvement of Rural Access and Tourism Roads in District Battagram, District Haripur, District Mansehra and District Tor Ghar [03-Lots]	
	Lot-1: Rehabilitation and Improvement of Rural Access Roads [02-Roads of 15.70 Km Length], and 01-RCC Bridge, District Battagram	Battagram
	Lot-2: Rehabilitation and Improvement of Tourism Roads [04-Roads of 22.88 Km Length], District Mansehra and District Haripur	Haripur
	Lot-3: Rehabilitation and Improvement of Rural Access Road "Karrak Madakhel to Hasan Zai Road" [22.10 Km Length], District Tor Ghar	Tor Ghar
12	Package-12: Rehabilitation and Reconstruction of Steel Bridges in Khyber Pakhtunkhwa <i>[19 Steel Bridges in One Package – Design & Built Contract]</i>	Steel Bridges
13	Package-13: Rehabilitation and Reconstruction of Tourism Roads [02-Roads of 23.90 Km Length], District Mansehra	Mansehra

1.8 Scope of Assessment & Corridor of Impact (COI)

37. The Project comprises a large number of roads under 10km in length. Out of 89 there are 53 roads that ranges from 3.4 to 9.9km in length. The scale of potential impacts on such small sections of roads is considered to almost negligible; as soon as they are not in sensitive environmental areas; when the low level interventions are factored in. It is also pertinent to mention that along the selected roads and bridges no environmental sensitivity (national park, wildlife sanctuary, games reserve area, forest reserve area) was found. However, two rods (such as RRD-LKH-R1, RRD-LKH-R2) and one ridge (KOH-BR-24) has been found near to the international designated site of IBA/KBA. As such, all roads under 10km in length will be managed through mitigation measures found in the project IEE and EMP and no further detailed assessment, other than what has been undertaken as part of Rapid Environmental Assessments for each road, will be included in this report.

Additionally, this approach will be applied to any bridge 30m or under in length. This is due to the fact that these bridge types will be single spans located outside of river beds and no interference with local hydrology, or aquatic biodiversity, is anticipated during construction in these areas.

38. The bridges and road's rehabilitation works in terms of formation width or construction limits, the project's corridor of impact (COI) is thus strictly limited to the existing and available width of carriageway and within the government owned official right of way (RoW). However, for the purpose of environmental assessment 250m distance on each side from center line of the roads and bridges was selected as COI.

1.9 IEE Objectives

39. The main purpose of the IEE study is to identify, evaluate and manage environmental and social impacts that may arise due to implementation and operation of the project. The document has been made to comply with the requirements of ADB Safeguard Policy 2009 and applicable local and national regulations.
40. IEE identifies the environmental issues to be considered at project planning and design stage. The IEE report covers the environmental profile of the study area and includes an overview of the potential environmental impacts and their magnitude on physical, ecological, economic, and social and cultural resources within the project's influence area during design, construction, and operation stages.
41. An Environmental Management Plan (EMP) for the project forms part of this report which includes mitigation measures for significant environmental impacts during implementation of the project, environmental monitoring program, and the responsible entities for mitigation and monitoring.
42. The IEE has four basic objectives: (i) identify the environmental issues that should be taken into account due to project activities; (ii) determine the magnitude of potential environmental concerns and to ensure that environmental considerations are given adequate weight at planning/design stage; (iii) identify need for further environmental studies or Environmental Impact Assessment (EIA); and (iv) suggest enhancement measures, if any.
43. The finalized IEE will be submitted in Environment Protection Agency (EPA), KP for approval under Khyber Pakhtunkhwa Environment Protection Act 2014.

1.10 Screening and Categorization of Project

44. Under the applicable ADB SPS 2009 the proposed project is screened according to type, location, scale, and sensitivity and the magnitude of their potential environmental impacts, including direct, indirect, induced, and cumulative impacts. Projects are classified into categories in terms of the potential significance of impacts, taking into account such factors as: the sector and scale of the project, the substance, degree and uncertainty of potential environmental and social impacts considering the environmental and social context of the proposed project site and surrounding areas. A total of 121 REAs were developed for this project, 89 for roads and 32 for bridges. During the preparation of REAs detail site surveys were conducted to ascertain the state of existing environment, presence of sensitive receptors, assessment of ecological and social environment. During the surveys special emphasis was given to water resources and prevailing hydrology in the subproject areas. The collected information during these surveys then compiled and arranged district wise to make it part of the IEE report.

45. The project is categorized as category 'B' in accordance with ADB Safeguard Policy Statement (SPS) 2009 due to its relatively low potential for adverse environmental impacts. These impacts are mostly site-specific and can generally be minimized through mitigation measures.
46. According to Khyber Pakhtunkhwa Environment Protection Agency (KPEPA) Environment Assessment Rules 2021, the project falls in schedule III that requires an IEE. The same IEE report that has been prepared and submitted in ADB will also be submitted to KP EPA for obtaining the environmental approval under Section 13 of Khyber Pakhtunkhwa Environment Protection Act. The relevant EMP /SSEMP will be shared with the regional office of the KP EPA.

1.11 Environment Study Methodology

47. As part of the IEE study, primary and secondary data were collected through field surveys, public consultations and literature research library. Consulted were the PIU of the project proponent, Meteorological Department, Soil Survey of Pakistan, Integrated Environment Laboratory, Statistical Survey of Pakistan, Departments of Forestry, Wildlife and Fisheries and Communication and Works Department of GoKP. Major data which became available from these sources were land use, soil and physiographic data, traffic and noise level, surface and ground water quality, and biodiversity. Above all the data on social and economic factors prevailing in project districts in general and in the project area in particular were obtained from Pakistan Statistical Year Book, District Gazetteer and Economic Survey of Pakistan.

1.12 Environmental Assessment Process

48. The methodology adopted to carry out the IEE Study of the proposed project was as follows:
- Orientation
 - Planning for Data Collection
 - Analysis of Maps
 - Literature Review
 - Desk Top Research
 - Site Reconnaissance
 - Public Consultations
 - Field Studies
 - Laboratory Analysis
 - Evaluation of Impacts and their analysis
 - Categorization of impacts based on their potential environmental significance and prescription of preventive / mitigation measures.
49. In addition to the evaluation and review of the available records, detailed discussions were held with the concerned members of the project management as well as other project stakeholders. Notes and proposals for measures to be taken to mitigate and compensate for any determined / detrimental environmental impacts are contained in the Environmental Management Plan (EMP) as well as a Monitoring Plan, including all

parameters that need to be measured and the frequency of monitoring. A comprehensive qualitative and quantitative methodology was adopted to conduct this study inter-alia in due compliance with the IEE requirements. The study includes collection of both primary and secondary data regarding environmental status and other relevant factors. This IEE report has been accomplished after carrying out thorough visit to the proposed site and detailed investigation to identify the following environmental areas of concern:

- To achieve the desired environmental compliance standards as per Safeguard Policy Statement (SPS) 2009 of Asian Development Bank and KP-EPA as national requirements, as applicable to the project.
- Plans and activities to prevent / mitigate any potential impacts and the gaps that could probably remain after implementation.
- Any other points / steps to be taken which could be beneficial to mitigate adverse environmental impacts that may accrue both during construction and regular operation of the project.

50. The methodology for environmental assessment is given in table 1.8.

Table 1-8: Environmental and Social Assessment Process

Phase	Activities	Status	Responsibility
Rapid Environmental Assessment	<ul style="list-style-type: none"> • Project site surveys (for each road and bridges), • Assessing the foot print of the for each road and bridges • Identification of the potential environmental and social impacts for each road and bridges • Based on environmental and social issues & applicable safeguard policy, • categorization and working out an action plan 	<ul style="list-style-type: none"> • Carried out at initial stage of the project 	<ul style="list-style-type: none"> • Project Design Consultants and Project Implementation unit
Screening and Scoping	<ul style="list-style-type: none"> • Detail site surveys and consultations, • identification of environmental and social issues & applicable safeguard policy, • categorization and working out an action plan. 	<ul style="list-style-type: none"> • Carried out during the present IEE 	<ul style="list-style-type: none"> • Project Design Consultants and Project Implementation unit
Establishing the Baseline	<p>Details site visit and assessment of the state of existing environment, the assessment was done through the followings to prepare the baseline of the project;</p> <ul style="list-style-type: none"> • Assessment of the Physical Environment of the project area (for all roads and bridges) including the local climate, geology, topography, hydrology, land use, etc. and their detail assessment of the project area, 	<ul style="list-style-type: none"> • Carried out during the present IEE 	<ul style="list-style-type: none"> • Project Design Consultants and Project Implementation unit

Phase	Activities	Status	Responsibility
	<ul style="list-style-type: none"> Assessment of ecological environment including the flora and fauna of the project area and their potential critical habitat, if any. Assessment Socio-economic environment of the project area. 		
Analysis of the alternatives	<ul style="list-style-type: none"> Different alternative analysis was carried out such as road alternative, design alternative, construction alternatives for the project 	<ul style="list-style-type: none"> Carried out during the present IEE 	<ul style="list-style-type: none"> Project Design Consultants and Project Implementation unit
Impact Assessment	Identification of potential environmental and social impacts through; <ul style="list-style-type: none"> site visits, stakeholder consultations, review of drawings, examination of alternatives etc. categorization of the impacts in low, moderate and high categorization of the impacts at different stages of the project 	During the preparation of the IEE	<ul style="list-style-type: none"> Project Design Consultants and Project Implementation unit
Impact categorization	The significant potential impacts were tabulated, and mitigation / preventive measures were prescribed.	During the present IEE	<ul style="list-style-type: none"> Project Design Consultants and Project Implementation unit
Stakeholder consultation	Consultations were carried out with various stakeholder including the local communities, and with various government departments relevant with the project.	During the present IEE	<ul style="list-style-type: none"> Project Design Consultants and Project Implementation unit
EMP Preparation	Consultation	Carried out / prepared as part of the present IEE	<ul style="list-style-type: none"> Project Design Consultants and Project Implementation unit
	Draft EMP		
Final	Final version of EMP produced	Included in the present IEE.	<ul style="list-style-type: none"> Project Design Consultants and Project Implementation unit

1.13 Field Surveys

51. A well-trained team including environmentalist, sociologist, and ecologist carried out the field survey. They undertook a two-phase consultation / survey program.
52. **Phase-I:** This phase comprised of meetings and discussions with the officials. The meetings facilitated achieving multiple and diverse objectives such as:



1. Evaluation of the site suitability in view of social acceptance and environmental soundness.
 2. Providing maximum information to stakeholders about the significant environmental impacts and the implication of the proposed project.
 3. Confirmation of the suitability of initial list of communities selected for consultation.
53. **Phase-II:** This phase involved the discussion with the local communities in the project area of influence.

1.14 Consultation with Women

54. The rural society in project area is highly conservative where direct access to women for social surveys, even with a female sociologist, is not possible for detail consultation. The community elders and aged women in selected localities hesitated to get their names recorded during the women consultation process. However, several meetings were held with women in different parts of the project, through village elders and women teachers.

1.15 Structure of Report

55. The structure of this report is listed below:
Section 1
56. **Introduction:** current section briefly presents the project and subprojects background, objectives, methodology and need of the IEE and EMP.
Section 2
57. **Policy, Legal and Administrative Framework:** Briefly discusses the environmental policy of ADB, existing national policy and resulting legislation for sustainable development and environmental protection, and then presents the legislative requirements of Khyber Pakhtunkhwa Environmental Protection Act, 2014.
Section 3
58. **Project Description:** Provides an overall description of the project and subproject including proposed networks, design considerations and concepts, manpower requirement, machinery and material requirements.
Section 4
59. **Description of the Environment:** Describes the project area’s existing physical, biological, and socioeconomic condition, including geomorphology and soils, water resources, and air quality, flora and fauna, and demography.
Section 5
60. **Analysis of Alternatives:** This section presents the project and subproject alternatives that were considered, and the reasons for their acceptance or rejection.
Section 6
61. **Evaluation of Impacts & Mitigation Measures:** Presents an assessment of the project’s impact and their required mitigation measures to the physical, biological, and socioeconomic environment.
Section 7



62. **Environmental Management Plan, Environmental Mitigation Measures and Monitoring Plan:** Contains comprehensive prescriptions regarding environmental impacts and their mitigation measures. This also includes institutional arrangements and Environmental Management & Monitoring Plan.
Section 8
63. **Stakeholders Consultations:** Identify the main stakeholders and their concerns raised, record of consultation meetings, for obtaining the views of local communities, local non-governmental organizations and regulatory agencies.
Section 9
64. **Grievance Redress Mechanism:** Describes the procedure for GRM in the project.
Section 10
65. **Conclusion and Recommendation:** Concludes the IEE report with some practical recommendations.

2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 General

- 66. This section provides an overview of the national legislations and international policy framework that applies to this project and subprojects.
- 67. The project is liable to comply with all national legislation relating to the environment in the province of Khyber Pakhtunkhwa and to obtain all the regulatory clearances required there under during the implementation of the project and subprojects. Since the project is financially assisted by the Asian Development Bank, there also required to comply with the international environmental safeguard standards.

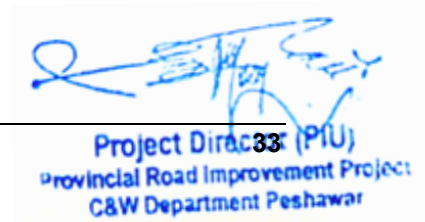
2.2 Applicable National and Provincial Acts/Rules and Regulations

- 68. The applicable national laws, rules, regulations are acts are described in the table 2.1.

Table 2-1: Applicable National and Provincial Acts/Rules and Regulations

Acts, Polices, Rules, Regulations and Standards	Brief Description	Relevance to the Subproject
Applicable National Regulations		
National Conservation Strategy (NCS)	The NCS outlines the country's primary approach towards encouraging sustainable development, conserving natural resources, and improving efficiency in the use and management of resources. The NCS has 68 specific programs in 14 core areas in which policy's intervention is considered crucial for the preservation of Pakistan's natural and physical environment.	Relevant. The project will develop in line with core areas of NCS in terms of physical environment of the project and areas.
National Environmental Quality Standards (NEQS) ³	The NEQS specify 32 parameters in municipal and liquid industrial and inland sewerage effluents, 16 parameters in gaseous emissions from various sources and two parameters in gaseous emissions from vehicle exhaust. Noise emission from vehicles and ambient air are also defined by the NEQS.	Relevant. Though environmental regulations have been delegated to the provinces, KP province still does not have their provincial environmental quality standards. Hence, national standards remain relevant for the province of KP. The project activities will also comply with (along with the most stringent standards) the NEQS for ambient air, noise and liquid and gaseous emissions.
Land Acquisition Act, 1894, Including Later Amendments ⁴	The Land Acquisition Act, 1894, is a "law for the acquisition of land needed for public purposes and for companies and for determining the amount of compensation to be paid	Not applicable. Since all the rehabilitation works will be carried out within the available RoW. No land acquisition will be required for the project roads

³ <https://www.mocc.gov.pk/SiteImage/Misc/files/NEQS%20for%20Ambient%20Air.pdf>
⁴ https://kpcode.kp.gov.pk/uploads/THE_LAND_ACQUISITION_ACT_1894.pdf



Acts, Polices, Rules, Regulations and Standards	Brief Description	Relevance to the Subproject
	on account of such acquisition". This law is applicable in resettlement of the community and ensures the provision of adequate compensation of land to the affected persons.	and bridges; therefore, this law is not applicable.
Protection of Trees and Brushwood Act, 1949	This act prohibits cutting or chopping of trees and brushwood without permission of the Forest Department.	Relevant. For the proposed project no trees cutting will be involved. Some bushes are required to be cut down.
The Forest Act, 1927	The Forest Act 1927 is designed to protect forest areas. Section 26 of the act prohibits the clearing of land, felling trees, cultivation, grazing livestock, trespassing, mining and collecting forest reserves along with setting traps or snares and poisoning of water.	Relevant. There are trees within the RoW, which needs to be cut down i therefore, the act is relevant.
Employment of Child Act, 1991	This act prohibits the employment of children in certain occupations and regulates the conditions of work of children. According to the definition in the act, a child is one who has not completed his 14 th year of education	Relevant Child labor will not be allowed in the proposed roads and bridges rehabilitation works.
Protection against Harassment of Women at the Workplace (Amendment) Act 2022 ⁵	The act provides the protection against harassment of women at the workplace. The amended act defines the "hostile environment" and general conditions of harassment at work sites.	Relevant The act is applicable to the and project subproject.
National Action Plan for COVID-19 Pakistan	Government of Pakistan has launched the National Action Plan for COVID-19 Pakistan to combat the challenge of prevailing virus, also available at https://www.nih.org.pk/wp-content/uploads/2020/03/COVID-19-NAP-V2-13-March-2020.pdf . The Government of Pakistan has launched the real-time data portal for COVID-19 http://covid.gov.pk/ . These measures are mostly relating to the containment and awareness and capacity building. Besides this COVID-19 daily situation report is also available at https://www.nih.org.pk/wp-content/uploads/2020/04/COVID-19-Daily-Updated-SitRep-03-April-2020.pdf .	This Action Plan for COVID-19 is applicable to the proposed project as it is being launched during the pandemic.
Pakistan Climate Change Act, 2017	This Act aims to meet obligations under international conventions	The project includes an assessment of climate change and

5 https://www.pc.gov.pk/uploads/act/Women_H_Work_Act_2022_Amendment.pdf

Acts, Polices, Rules, Regulations and Standards	Brief Description	Relevance to the Subproject
	relating to climate change and to provide for the adoption of comprehensive adaptation and mitigation policies, plans, programs, projects and other measures required to address the effects of climate change and for matters connected herewith and ancillary thereto.	appropriate measures to mitigate its impact in the design. The road design is well-suited by incorporating the recommendations from the climate change assessment.
Applicable Provincial Regulations		
Khyber Pakhtunkhwa Occupational Safety and Health Act, 2022	The act describes the roles and responsibilities of employer, worker, work site conditions, hygienic conditions of site, incident records and formation of safety counsel.	Relevant The OHS plan for the proposed project and subproject will ensure compliance with this act.
KP Environmental Protection Act, 2014 ⁶	<p>KP Environmental Protection Act 2014 is the apex environmental law governing the subproject, and KPEPA is responsible for ensuring the implementation of provisions of the Act in KP's territorial jurisdiction.</p> <p>The following key features of the provincial act have a direct bearing on the proposed project:</p> <p>Section 11 (prohibition of certain discharges or emissions) states that "subject to the provisions of this act and the rules and regulations made there under, no person shall discharge or emit, or allow the discharge or emission of, any effluent or waste or air pollutant or noise in an amount, concentration or level which is in excess of the National Environmental Quality Standards (NEQS)".</p> <p>Section 13-i (Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA)) requires that "no proponent of a project shall commence construction or operation unless he has filed with the EPA an IEE or, where the project is likely to cause an adverse environmental effect, an EIA, and has obtained from this agency approval in respect thereof."</p> <p>Section 13-2b (review of IEE and EIA): the environmental protection agency shall review the EIA report and accord its approval subject to such conditions as it may deem fit to</p>	Relevant The project will ensure compliance of this act during implementation. Environmental approval shall be obtained before commencement of any works at project and subproject levels.

6 https://few.kp.gov.pk/uploads/2022/09/Environmental_Protection_Act,_2014.pdf

Acts, Polices, Rules, Regulations and Standards	Brief Description	Relevance to the Subproject
	<p>impose, or require that the EIA be re-submitted after such modifications as may be stipulated or rejected, the project as being contrary to environmental objectives.</p> <p>Section 15 (Handling of hazardous substances) requires that “subject to the provisions of this act, no person shall generate, collect, consign, transport, treat, dispose of, store, handle, or import any hazardous substance except (a) under a license issued by the EPA and in such manner as may be prescribed; or (b) in accordance with the provisions of any other law for the time being in force, or of any international treaty, convention, protocol, code, standard, agreement, or other instrument to which Pakistan is a party.” enforcement of this clause requires the EPA to issue regulations regarding licensing procedures and to define ‘hazardous substance.’</p> <p>Section 16 (Regulation of motor vehicles): subject to provision of this clause of the act and the rules and regulations made there under, no person shall operate a motor vehicle from which air pollutants or noise are being emitted in an amount, concentration or level which is in excess of the NEQS, or where the applicable standards established under clause (g) of subsection (1) of section-6 of the act.</p> <p>Section 18 (Penalties): whoever contravenes or fails to comply with the provisions of section 11, 12, 13, or section 17 or any order issued there under shall be punishable with fine which may extend to one million rupees and in the case of a continuing contravention or failure, with an additional fine which may extend to one hundred thousand rupees for every day during which such contravention or failure continues: provided that if contravention of the provisions of section 11 also constitutes contravention of the provisions of section 16, such</p>	

Acts, Polices, Rules, Regulations and Standards	Brief Description	Relevance to the Subproject
	<p>contravention shall be punishable under sub-section (2) only.</p> <p>Section 19 (offences by bodies corporate): where any contravention of this act has been committed by a body corporate, and it is proved that such offence has been committed with the consent or connivance or, is attributed to any negligence on the part of, any director, partner, manager, secretary or other officer of the body corporate, such director, partner, manager, secretary or other officer of the body corporate, shall be deemed guilty of such contravention along with the body corporate and shall be punished accordingly.</p>	
<p>KP Environmental Assessment Rules 2021⁷</p>	<p>The rules establish the framework for the preparation, submission, and review of the general environmental approval (GEA), IEE and EIA. The rules categorize development projects for GEA, IEE and EIA into three Schedules (Schedules II and III and IV). Schedule II covers major projects that have the potential to affect a large number of people in addition to generating potentially significant adverse environmental impacts. Preparation of a complete EIA is required for Schedule II projects. Schedule III includes projects where the range of environmental issues is comparatively limited and the issues can be understood and managed through less extensive analysis and IEE required. Schedule IV includes projects where the range of environmental issues are negligible and comparatively limited general approval is required.</p>	<p>Relevant</p>
<p>KP Wildlife and Biodiversity Act, 2015</p>	<p>This act provides for the protection, preservation, conservation and management of wildlife in KP.</p>	<p>The proposed rehabilitation works of roads and bridges do not pass through any national park or other protected area neither is there any other ecological hotspot located near or along the RoW. However, relevant measures for protection of fauna in case of any</p>

⁷ <https://epakp.gov.pk/wp-content/uploads/2021/09/Khyber-Pakhtunkhwa-Environmental-Assessment-Rules-2021.pdf>

Acts, Polices, Rules, Regulations and Standards	Brief Description	Relevance to the Subproject
		accidental encounter have been included in the EMP.
KP Climate Change Policy, 2016	The government of KP formulated a Provincial Climate Change Policy in June, 2016, to the specific needs of the province.	In view of this policy, the subproject design has considered climate resilient measures (strengthening, widening, additional culverts, raising the embankments of the roads alignment where required, paving of shoulders, etc).
KP Commission on the Status of Women	The Commission in Khyber Pakhtunkhwa is the first ever Provincial Level Commission in the country, established with functions to oversee implementation of laws, policies and programs related to women and propose new measures where gaps exist.	Relevant The act is applicable to the subproject.
Pakistan Antiquities Act 1975 & KP Antiquities Act 2016	<p>The KP Antiquities Act, 2016 is adopted from the Pakistan Antiquities Act of 1975 with a few minor changes. The Antiquities Act, 1975 (amended in 1990) states the following:</p> <ul style="list-style-type: none"> • “Ancient” is any object that is at least 75 years old; • All accidental discoveries of artefacts must be reported to the Federal Department of Archaeology; • The Government is the owner of all buried antiquities discovered on any site, whether protected or otherwise; • All new construction within a distance of 200 feet from protected antiquities is forbidden; • No changes or repairs can be made to a protected monument, even if it is owned privately, without approval of the responsible authorities; and • The cultural heritage laws of Pakistan are uniformly applicable to all categories of sites regardless of their state of preservation and classification as monuments of national or world heritage. 	<p>Relevant The law will be applicable to the project mainly due to its two provisions:</p> <p>According to the law, any construction activity within 61 meter or 200 ft. of protected antiquities, are prohibited.</p> <p>The provisions of this act would also be applicable, if any accidental archaeological discoveries may occur during the excavation works for the construction of proposed Project.</p>
KPK Explosives Act (2013)	This Act is expedient to regulate the manufacture, possession, use, sale and transportation of explosives in the Province of the KPK.	Relevant. No blasting is involved for the project and subprojects, however, in case of new quarry site this act can be triggered.

Acts, Polices, Rules, Regulations and Standards	Brief Description	Relevance to the Subproject
KPK Workers Compensation Act (2013)	This act is expedient to provide for the payment by certain classes of employers to their workers or their legal heirs of compensation for injury or death by accident.	Relevant
KP Bonded Labour System (Abolition) Act (1995)	<p>The Bonded Labor System (Abolition) Act seeks to eradicate bonded labor practices prevailing in the province. The Act defines the 'Bonded Labor System' as a system of forced, or partly forced, labor under which a debtor enters, or is presumed to have entered into an agreement with the creditor to the effect that:</p> <ul style="list-style-type: none"> • In consideration of an advance obtained by him or by any of the members of his family (whether or not such advance is evidenced by any document) and in consideration of the interest, if any, due on such advance, or • In pursuance of any customary or social obligation, or • For any economic consideration received by him or by any member of his family. 	Relevant No bonded labour will be allowed for the project and subprojects.

2.2.1 Policy and Procedures for the Filing, Review and Approval of Environmental Assessments (1997)

69. These guidelines define the policy context and the administrative procedures that govern the environmental assessment process, from the project prefeasibility stage to the approval of the environmental report. Requirements for the preparation of an Environmental Management Plan (EMP) are also covered. An EMP is defined as a “document designed to ensure that the commitments in the Environmental Report, subsequent review reports, and Environmental Approval conditions are fully implemented” and is “usually finalized during or following detailed design of the proposal, after Environmental Approval of the development application”. This IEE has been prepared in compliance with this policy.

2.2.2 Guidelines for Public Consultation, 1997

70. The Guidelines for Public Consultation cover approaches and techniques for effective public consultation. An effective consultation strategy is considered to be one that captures the views of all major stakeholders, allowing for the incorporation of concerns in the impact assessment. Consultations have been carried out during EIA preparation in accordance with these Guidelines



2.3 Interaction with Other Agencies

71. The Communication & Works Department, GoKPK is responsible for ensuring that the project complies with the laws and regulations controlling the environmental concerns of the proposed road construction and operation and that all preconstruction requisites, such as permits and clearances are met.

2.4 International Safeguard Policy

2.4.1 ADB's Safeguard Policy Statement (SPS), 2009

72. The Asian Development Bank's Safeguard Policy Statement (SPS) 2009 requires that environmental considerations be incorporated into ADB's funded project to ensure that the project will have minimal environmental impacts and be environmentally sound. Health and safety of the local population should also be addressed as well as that of project workers as stated in SPS. A Grievance Redress Mechanism (GRM) to receive application and facilitate resolution of affected peoples' concerns, complaints, and grievances about the project's environmental performance is also established in this assessment report. All loans and investments are subject to categorization to determine environmental assessment requirements. Categorization is to be undertaken using Rapid Environmental Assessment (REA) checklists, consisting of questions relating to (i) the sensitivity and vulnerability of environmental resources in project area, and (ii) the potential for the project to cause significant adverse environmental impacts. Projects are classified into one of the following environmental categories:

- a) **Category A:** a proposed project is classified as category 'A' if it is likely to have significant adverse environmental impacts that are irreversible, diverse or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An Environmental Impact Assessment (EIA) is required.
- b) **Category B:** a proposed project is classified as category 'B' if its potential adverse environmental impacts are less adverse than those of category 'A' projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category 'A' projects. An Initial Environmental Examination (IEE) is required.
- c) **Category C:** a proposed project is classified as category 'C' if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
- d) **Category Fi:** a proposed project is classified as category Fi if it involves investment of ADB funds to or through a financial intermediary (Fi).

2.5 Categorization of the Project as per ADB SPS 2009

73. As a result of the completion of the REA checklist (annexure-1) and through sites visits it has been concluded that no long term, irreversible, potential impacts are associated with the project, therefore, the overall project of rural roads rehabilitations programme, has been classified as category 'B' and thus a detailed and comprehensive IEE study has been prepared including the EMP.

2.5.1 ADB Access to Information Policy (AIP) 2018

74. ADB's new Access to Information Policy (AIP), reflects the ADB's ongoing commitment to transparency, accountability, and participation by stakeholders. The policy contains

principles and exceptions to information sharing with external stakeholders, led by a new overarching principle of “clear, timely, and appropriate disclosure.” The proposed project involves stakeholders and it would be necessary to engage all the stakeholders in the entire process. The prepared safeguards instruments will be disclosed in accordance with the requirements of the policy.

2.5.2 ADB’s Accountability Mechanism Policy 2012

75. The objectives of the accountability mechanism is providing an independent and effective forum for people adversely affected by ADB-assisted projects to voice their concerns and seek solutions to their problems and to request compliance review of the alleged noncompliance by ADB with its operational policies and procedures that may have caused or is likely to cause, them direct and material harm. The accountability mechanism a “last resort” mechanism.

2.6 Implications of ADB Policies on Proposed Project

76. The objectives of ADB’s safeguards are to:
- Avoid adverse impacts of projects on the environment and affected people, where possible;
 - Minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and
 - Help borrowers/clients to strengthen their safeguard systems. ADB’s SPS sets out the policy objectives, scope and triggers, and principles for three key safeguard areas:
 - Environmental safeguards;
 - Involuntary resettlement safeguards, and
 - Indigenous peoples’ safeguards.
77. The objective of the environmental safeguards is to ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process. ADB’s policy principles are summarized in table 2.2 below.

Table 2-2: ADB Environmental Policy Principles

Sr. No	Policy Principle	Summary
1.	Screening and categorization	Screening process initiated early to determine the appropriate extent and type of environmental assessment.
2.	Environmental assessment	Conduct an environmental assessment to identify potential impacts and risks in the context of the project’s area of influence.
3.	Alternatives	Examine alternatives to the project’s location, design, technology, and components and their potential environmental and social impacts, including no project alternative.
4.	Impact Mitigation	Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts. Prepare an environmental management plan (EMP).
5.	Public Consultations	Carry out meaningful consultation with affected people and facilitate their informed participation. Involve stakeholders early in the project preparation process and ensure that their views and concerns are made known to and understood by

Sr. No	Policy Principle	Summary
		decision makers and taken into account. continue consultations with stakeholders throughout project implementation. Establish a grievance redress mechanism.
6.	Disclosure of Environmental Assessment	Disclose a draft environmental assessment in a timely manner, in an accessible place and in a form and language(s) understandable to stakeholders. Disclose the final environmental assessment to stakeholders.
7.	Environmental Management Plan	Implement the EMP and monitor its effectiveness. Document monitoring results, and disclose monitoring reports.
8.	Biodiversity	Do not implement project activities in areas of critical habitats.
9.	Pollution prevention	Apply pollution prevention and control technologies and practices consistent with international good practices. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges. Avoid the use of hazardous materials subject to international bans or phase outs.
10.	Occupational health and safety Community safety.	Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities
11.	Physical Cultural Resources	Conserve physical cultural resources and avoid destroying or damaging them. Provide for the use of "chance find" procedures.

2.7 Comparison of International and Local Environmental Legislations

- 78. The ADB SPS requires application of pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards. The SPS states that when host country regulations differ from these standards, the more stringent will apply.
- 79. A comparison of applicable local and international guidelines for ambient air quality has been provided in table 2.3 below. In the case of most pollutants, the NEQS standards for ambient air quality are more stringent in comparison to USEPA and WHO/IFC standards.
- 80. Similar to the standards for air quality, the comparison of noise standards provided in table 2.4, and clearly shows that NEQS standards for noise are more stringent in comparison to the WHO/IFC standards. The only exception is the daytime noise level standard for industrial areas where the World Bank/IFC standard is more stringent (70 dB(A)) in comparison to NEQS (75 dB (A)) and so for this particular parameter, the WHO/IFC standard will be used. Apart from this one exception, the NEQS standards have been used for the proposed road construction project.
- 81. As far as regulations regarding other environmental parameters are concerned such as acceptable effluent disposal parameters, the local regulations i.e. NEQS take precedence over any other international regulations such as WHO/IFC.

Table 2-3: Comparison of International and Local Air Quality Standards

pollution	USEPA		WHO/IFC		PAK. NEQS	
	Avg. time	Standards	Avg. time	Standards	Avg. time	Standards
SO ₂	3 hrs	0.5 ppm	24 hr	80 µg/m ³	annual mean	80 µg/m ³
	1 hr	75 ppb	10 mins	500 µg /m ³	24 hrs	120 ug/m ³

pollution	USEPA		WHO/IFC		PAK. NEQS	
	Avg. time	Standards	Avg. time	Standards	Avg. time	Standards
CO	8 hrs	9 ppm (11 mg/m ³)	24 hr	4(mg/m ³)-	8 hrs	5 mg/m ³
	1 hr	35 ppm (43 mg/m ³)			1 hr	10 mg/m ³
NO ₂	annual mean	100 ug/m ³ (53 ppb)	1yr	40 µg/m ³	annual mean	40 µg/m ³
	1 hr	100 ppb	1 hr	200 µg/m ³	24 hrs	80 µg/m ³
O ₃	8 hrs	0.07 ppm (148 ug/m ³)	8 hrs	100 µg/m ³	1 hr	130 µg/m ³
TSP	-	-	-	-	annual mean 24 hrs	360 µg/m ³ 500 µg/m ³
PM ₁₀	24 hrs	150 ug/m ³	1 yr	20 µg/m ³	annual mean 24 hrs	120 µg/m ³
			24 hr	45 µg/m ³		150 µg/m ³
PM _{2.5}	annual mean	15 ug/m ³	1 yr	10 µg/m ³	annual average	15 µg/m ³
	24 hrs	35 ug/m ³	24 hrs	25 µg/m ³	24 hrs	35 µg/m ³
					1hr	15 µg/m ³

Table 2-4: Comparison of International and Local Noise Standards

category of area/zone	Limit in db(a) Leq			
	NEQS		WHO/IFC	
	Day time 06:00– 22:00	Night time 22:00-06:00	Day time 07:00 – 22:00	Night time 22:00-07:00
Residential Area (A)	55	45	55	45
Commercial Area (B)	65	55	70	70
Industrial area (c)	75	65	70	70
Silence zone (d)	50	45	55	45

*: The standards highlighted in green for each respective Area/Zone are the most stringent based on a comparison between local and international regulations and thus shall be applicable for the proposed project.

* In instances where baseline noise levels are already exceeding the standards above, it will need to be ensured that the project activities do not cause an increment of more than 3 dB(A) from the baseline noise levels.

2.8 Drinking and Waste Water

82. The applicable drinking and waste water quality standards are provided in table 2.5 and 26 respectively.

Table 2-5: Applicable Drinking Water Standards

Parameter	Unit	NEQS	WHO/IFC
Bacterial Parameters			
E-Coli	numbers/ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample
Total Coliform	numbers/ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample
Physical Parameters			

Parameter	Unit	NEQS	WHO/IFC
Color	TCU	≤ 15 TCU	-
Taste	No objectionable /Acceptable	-	-
Odor	No objectionable/Acceptable	-	-
Turbidity	NTU	< 5 NTU	
Total Hardness	mg/l	< 500 mg/l	
TDS	mg/l	< 1000	
pH		6.5-8.5	
Chemical Parameters			
Aluminum	mg/l	≤0.2	0.2
Antimony	mg/l	≤0.005 (P)	<0.005 (P)
Arsenic	mg/l	≤0.005 (P)	0.01
Barium	mg/l	0.7	0.3
Boron	mg/l	0.3	0.3
Cadmium	mg/l	0.01	0.0003
Chloride	mg/l	<250	250
Chromium	mg/l	≤0.05	0.05
Copper	mg/l	2	2
Cyanide	mg/l	≤0.05	0.07
Fluoride	mg/l	<1.5	1.5
Lead	mg/l	≤0.05	0.01
Manganese	mg/l	≤0.5	0.5
Mercury	mg/l	≤0.0001	0.0001
Nickel	mg/l	≤0.02	0.02
Nitrate	mg/l	≤50	50
Nitrite	mg/l	≤3	-
Selenium	mg/l	0.01	0.01
Residual Chlorine	mg/l	0.2-0.5 at consumer end	-
Zinc	mg/l	5	3

*. The standards highlighted in green for each respective Area/Zone are the most stringent based on a comparison between local and international regulations and thus shall be applicable for the proposed project.

Table 2-6: Applicable Wastewater Quality Standards

S. No.	Parameter	NEQS Standards (Wastewater discharge Into Inland Waters)	EU Council Directive, 91/271/EEC, Urban Wastewater Discharge Directive
1	Temperature/Temperature Increase	≤3°C	-
2	pH Value	6-9	-
3	BOD at 20°C	80	25
4	COD	150	125
5	TSS	200	35
6	TDS	3500	-
7	Grease and Oil	10	-
8	Phenolic compounds (as phenol)	0.1	-
9	Chloride	1000	-
10	Fluoride	10	-
11	Cyanide	1.0	-
12	An-ionic detergents	20	-
13	Sulfate	600	-
14	Sulfide	1.0	-

S. No.	Parameter	NEQS Standards (Wastewater discharge Into Inland Waters)	EU Council Directive, 91/271/EEC, Urban Wastewater Discharge Directive
15	Ammonia	40	-
16	Pesticides	0.15	-
17	Cadmium	0.1	-
18	Chromium Total	1.0	-
19	Copper	1.0	-
20	Lead	0.5	-
21	Mercury	0.01	-
22	Selenium	0.5	-
23	Nickel	1.0	-
24	Silver	1.0	-
25	Total Toxic Metals	2.0	-
26	Zinc	5.0	-
27	Arsenic	1.0	-
28	Barium	1.5	-
29	Iron	8.0	-
30	Manganese	1.5	-
31	Boron	6.0	-
32	Chlorine	1.0	-

3 DESCRIPTION OF THE PROJECT

3.1 Type of Project

83. As mentioned earlier, three types of the roads have been selected in the project as (a) **access roads**: 37 access roads will be rehabilitated see table 1.3 and figure 1-2, these roads will provide an easy access and connectivity to main trunk roads (b) **tourism roads**: 19 tourism roads will be rehabilitated which will give a smooth flow of traffic to important to tourism points in KP and will also boost the economy of the province, (c) **flood affected roads**: 33 flood affected roads will be rehabilitated for re-connection and rehabilitation of the flood affected areas (d) 32 bridges will be rehabilitated among with 19 will be pre-fabricated steel bridges. The proposed roads will ensure a reduction in vehicle operating costs, increase tourism in northern areas and also decreasing in travel time, while adequately connect the agriculture market with roads network. Safety considerations in rehabilitation of roads and bridges will avert accidents and enhance road safety. Also, it will help the commuters in a decrease in travel time. Furthermore, the rehabilitation of the proposed roads will contribute a lot to the economic growth, tourism, and overall development of KP province. Additionally, it will support the vision of the government to promote tourism in KP and attract tourists to this region.

3.2 Project Selection

84. Multi-criteria analysis (MCA) technique was employed in short listing of roads and bridges which has been detailed in section 1 (serial 1.6) of the IEE report.

3.3 Project Location

85. The overall footprint of the RRDP falls in the Khyber Pakhtunkhwa province, total of twenty districts including Bannu, Battagram, Charsadda, Chitral, DI Khan, Dir Lower and upper, Karak, Kohat, Kohistan lower and upper, Bunner, Haripur, Swabi, Mansehra, Swat, Malakand, Shangla, Tor Ghar, Peshawar are covered both for roads and bridges. The locations of these roads and bridges are shown in figure 3-1.

Figure 3-1: Roads and Bridges



Locations of roads and bridges in Banu



Locations of roads and bridges in Battagram



Locations of roads and bridges in Buner



Locations of roads and bridges in Charsadda



Locations of roads and bridges in Chitral



Locations of roads and bridges in D.I.Khan



Locations of roads and bridges in Dir Lower



Locations of roads and bridges in Dir Upper



Locations of roads and bridges in Haripur



Locations of roads and bridges in Karak



Locations of roads and bridges in Kohat



Locations of roads and bridges in Kohistan



Locations of roads and bridges in Malakand



Locations of roads and bridges in Mansehra



Locations of roads and bridges in Mardan



Locations of roads and bridges in Nowshera



Locations of roads and bridges in Peshawar



Locations of roads and bridges in Shangla



Locations of roads and bridges in Swabi



Locations of roads and bridges in Swat



Locations of roads and bridges in Torgarh

3.4 Design

- 86. The design specifications include; 5.505 meters (18 feet) wide carriageway and 0.6-meter (2 feet) drain on both sides in built-up areas, while in rural areas the revised design specifications are: 6.1 meters (20 feet) wide carriageway and 0.6-meter (2 feet) drain on both sides. This means that construction activities will be strictly limited to a designed width of 6.7 meters (22 feet).
- 87. The design adjustments at some locations are such that one location has the construction limit reduced to 5.8 meters (19 feet) while in remaining 5 locations the construction limit has been adjusted to 24 feet. The official government owned RoW is 36 feet as per the revenue record where the rehabilitation work will be done. With adjustments in design width of construction/rehabilitation work, all resettlement impacts have been completely avoided.
- 88. Similarly, total of 32 existing bridges will be rehabilitated, out of which 19 bridges will be of prefabricate steel bridges will be used. These existing bridges are a source of connecting the roads while some are making connections on the main roads such as Siren bridge, bridge over Landay Khwar and kharmatoo road billeting bridge. Most of the bridges are on low flow nullah and tributaries.

3.5 Project Selection

- 89. Multi-criteria analysis (MCA) technique was employed in short listing of roads and bridges which has been detailed in section 1 of the. IEE report. Scope of Work
- 90. The scope of work under the rehabilitation/improvement of proposed roads is as below:

3.5.1 Scope of work for Roads

- Currently, the available right of way is 18m to 23m (for all roads) which is not fully black topped, shoulders are not available and road conditions are not up to the national or international design (AASHTO) criteria. The required ROW will be 22.5m for the rehabilitation and improvement of the proposed roads. In short for all roads rehabilitation the existing ROW will be fully utilized.

- Where required the retaining wall will be provided. A minimum of 1km to a maximum of 5.25km retaining wall will be constructed at various RDs along the project roads.
- Provision of drains (a minimum of 10 to maximum of 24 drain at various RDs) along the roads
- Culverts and box culverts of varying sizes and various locations along the roads.
- Road furniture and signage (including furniture/signs, better slopes, landscaping, guardrails and crash barriers, etc.)
- 4-5 to 6.5m (variable) carriage way (asphalt top) along the road of the project.
- 1m to 2m (variable) PCC shoulder on each side at various locations.
- A retaining wall for embankment heights greater than 3m to check the erosion of embankment by the rains or failure of the slopes due to scouring or otherwise.
- A guard rail for embankment heights greater than 3m.
- Road furniture and signage.
- The proposed thickness of Rigid Pavement Concrete is 250 mm while Sub Base thickness will be 150 mm in rehabilitation works.

3.5.2 Scope of work for Bridges

91. All the bridges will be rehabilitated with the existing ROW and structures, no new or additional span will be added, all the ROW shall be utilized and structures will be strengthened with concrete and steel parts. Among 32 total of 19 bridges will be of prefabricated steel structures.

3.6 Preliminary Investigations

92. The phases of road investigations include road side inventory and structures inventory validation can also be attributed under this section.

- **Setting out**

Setting out covers horizontal & vertical alignment, join cross sections preparations, preparation of earthwork and trimming of subgrades.

- **Earth Works**

Earth work includes to clearing grubbing, roadway excavation, formation of embankment etc. National Highway Authority General Specifications is trailed for all the activities pertaining to Earth Work during road construction.

- **Road Works**

Road works includes mainly construction of rigid pavement (JPCP).

All the activities pertaining to Road Works during road construction are executed as per guide lines set in National Highway Authority General Specifications.

- **Structure Works**

Structure work includes construction of cross drainage structures particularly culverts & bridges. The entire testing requirement prescribed in ASTM is followed for quality assurance.

- **Drainage & Anti Erosion Works**

Drainage & Anti Erosion work involves storm water drains along the road, urban drainage, surface erosion protection.

National Highway Authority General Specifications is trailed for all the activities pertaining to Drainage & Anti Erosion Work during road construction.

- **Road Furniture**

Road Furniture Includes items at the road side including furniture/signs, batter slopes, landscaping, guardrails and crash barriers etc.

3.7 Design Criteria

93. Design Criteria for all alignment of project roads is given in the table 3.1.

Table 3-1: Design Features of the Rehabilitation Works

Sr. No.	Parameters	TERRAIN		
		Unit	Plain	Hilly
1.	Design Speed	Km./hr.	80-100	60
2.	Horizontal Curvature (Min. Radius)	M	150	100
3.	Maximum Super elevation	%	6	6
4.	Tangent Run out Length	M	43	31
5.	Cross Slope:			
	Pavement	%	2	2
	Shoulders	%	4	4
6.	Sight Distance			
	Maximum Stopping (SSD)	M	130	116
	Maximum Passing (PSD)	M	540	370
7.	Maximum Gradient			
	K-Value for Crest Vertical Curve for SSD 264	M/%A	26	4
	K-Value for Crest Vertical Curve for PSD	M/%A	338	84
	K-Value for Sag Vertical Curve for SSD	M/%A	30	9
8	Embankment: Fill Side Slope	(H:V)	2:1	
09	Right of way	m	17.75m to 23m (variable)	

94. For the bridges all the rehabilitation works will be within the existing ROW, no additional span or increase of width is proposed. Minimum 01 to maximum 05 spans (variable) are proposed.

3.8 Typical Cross Sections

95. The typical cross sections of project roads for built up area and rural area are given as followings keeping in view the requirements of the roads conditions.

- Typical Section Type-I (A) is applicable for Existing Road is Asphalt. Figures 3-1
- Typical Section Type-I (B) is applicable for Existing Road is TST. Figures 3-2
- Typical Section Type-I (C) is applicable for Existing Road is Kacha. Figures 3-3

- Typical Section Type-I (D) is applicable for Existing Road is Shingle. Figures 3-4
- Typical Section Type-I (E) is applicable for Existing Road is PCC. Figures 3-5
- Typical Section Type-II (A) is applicable for Existing Road is Asphalt. Figures 3-6
- Typical Section Type-II (B) is applicable for Existing Road is TST. Figures 3-7
- Typical Section Type-II(C) is applicable for Existing Road is Kacha, Figures 3-8
- Typical Section Type-II (D) is applicable for Existing Road is Shingle. Figures 3-9
- Typical Section Type-II (E) is applicable for Existing Road is PCC Figures 3-10
- Typical Section Type-III (A) is applicable for Existing Road is Asphalt. Figures 3-11
- Typical Section Type-III (B) is applicable for Existing Road is TST. Figures 3-12
- Typical Section Type-III (C) is applicable for Existing Road is Kacha. Figures 3-13
- Typical Section Type-III (D) is applicable for Existing Road is Shingle. Figures 3-14
- Typical Section Type-III (E) is applicable for Existing Road is PCC Figures 3-15
- Typical Section Type-IV (A) is applicable for Existing Road is Asphalt. Figures 3-16
- Typical Section Type-IV (B) is applicable for Existing Road is TST. Figures 3-17
- Typical Section Type-IV (C) is applicable for Existing Road is Kacha. Figures 3-18
- Typical Section Type-IV (D) is applicable for Existing Road is Shingle. Figures 3.19
- Typical Section Type-V (A) is applicable for Existing Road is Asphalt. Figures 3-20
- Typical Section Type-V (B) is applicable for Existing Road is TST Figures 3-21

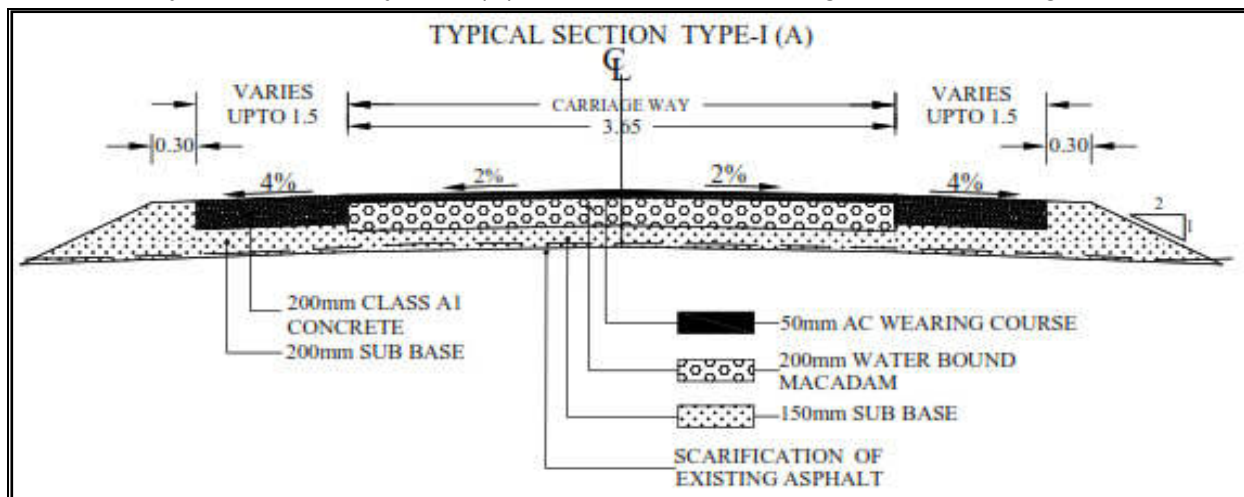


Figure 3-2: Type-I (A) Typical Cross Section

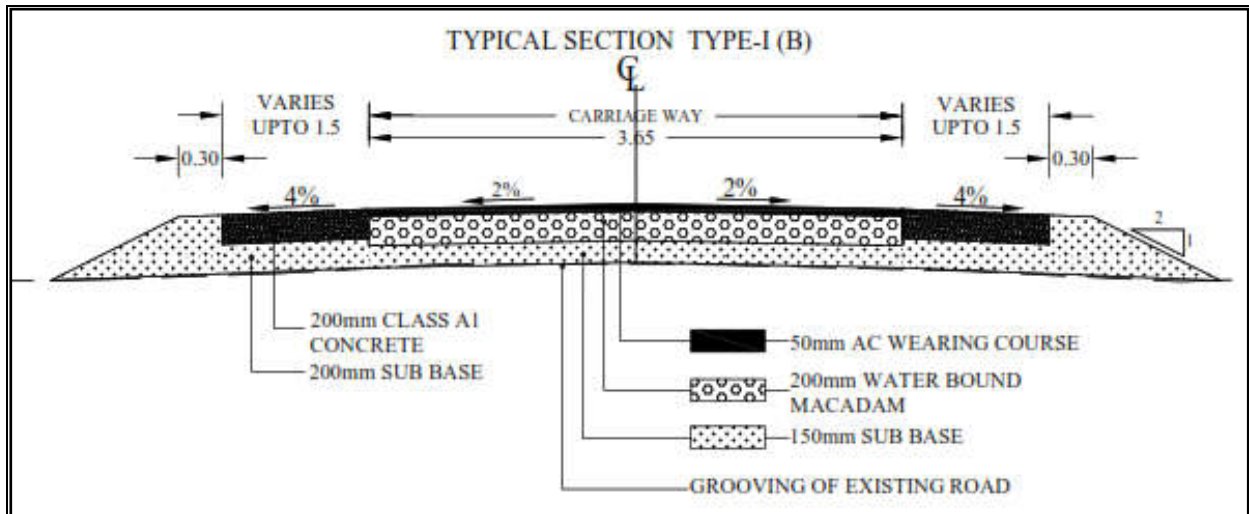


Figure 3-3: Type- I (B) Typical Cross Section

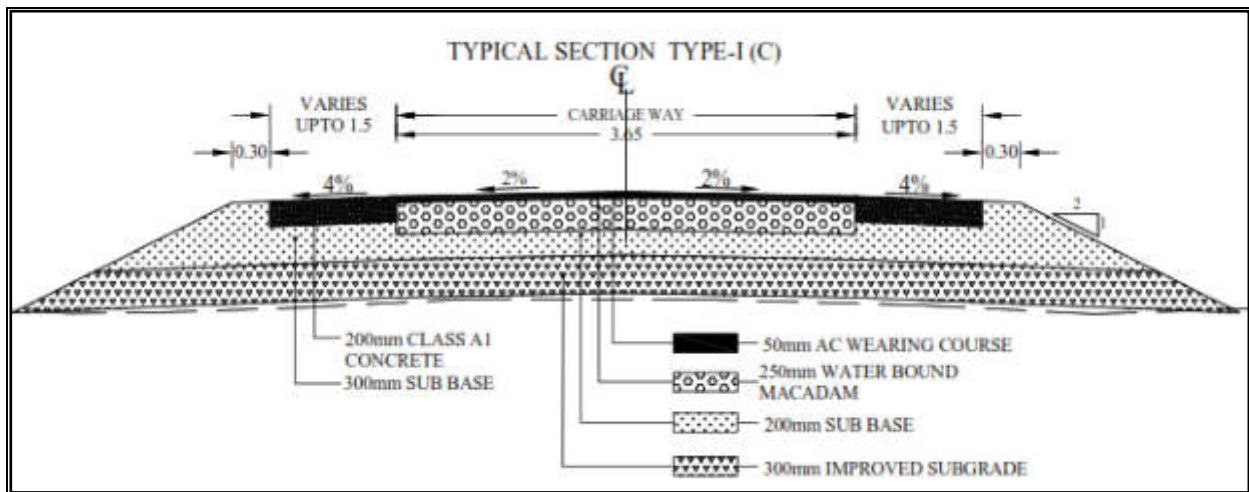


Figure 3-4: Type- I (C) Typical Cross Section

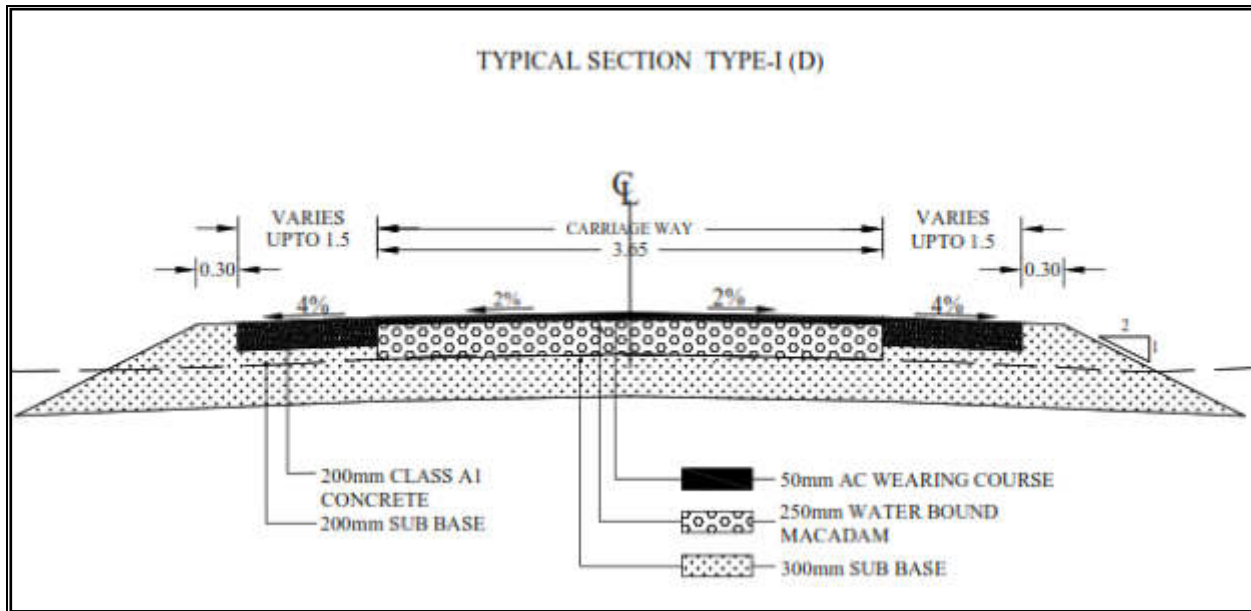


Figure 3-5: Type- I (D) Typical Cross Section

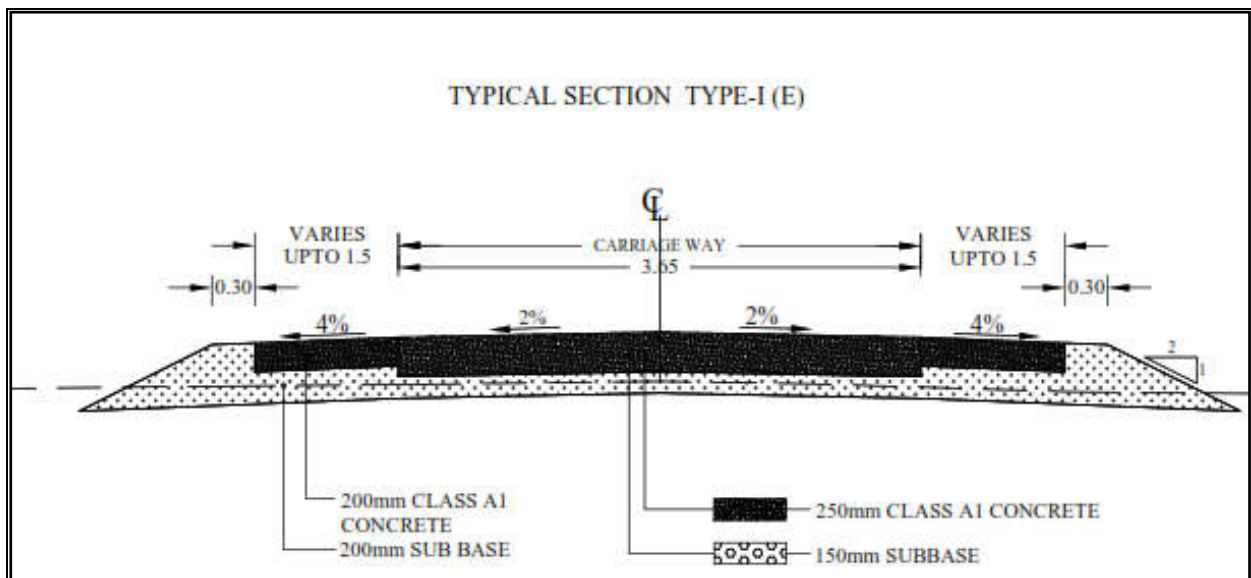


Figure 3-6: Type-I (E) Typical Cross Section

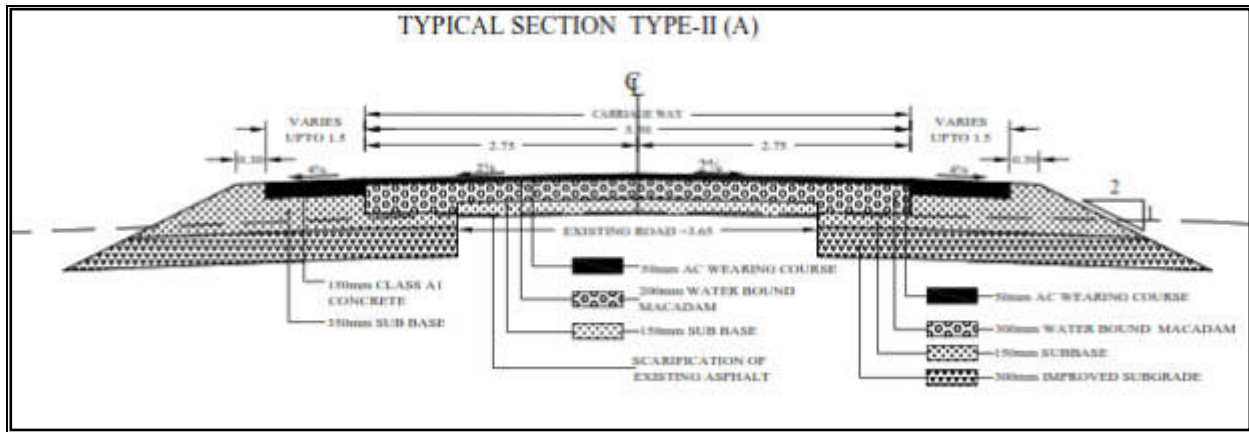


Figure 3-7: Type-II (A) Typical Cross Section

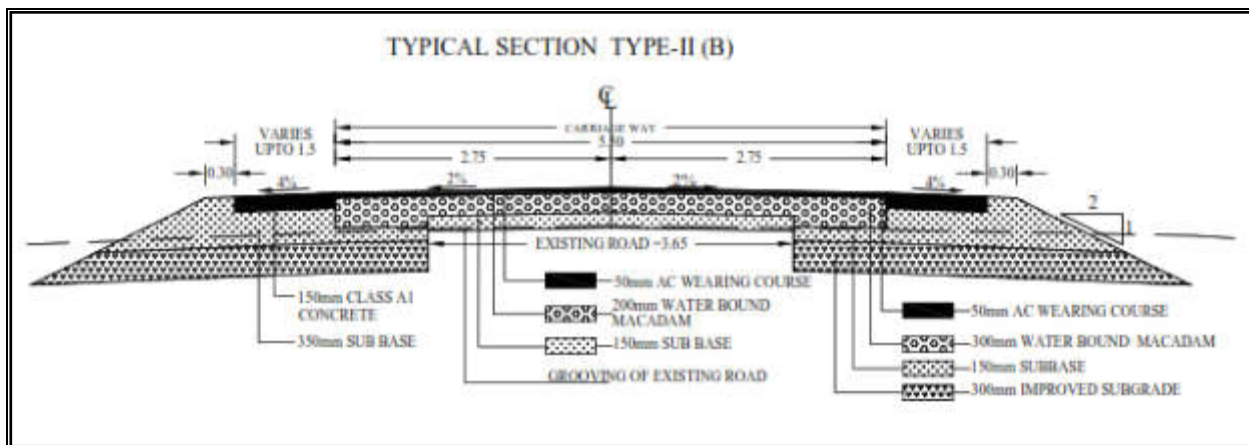


Figure 3-8: Type-II (B) Typical Cross Section

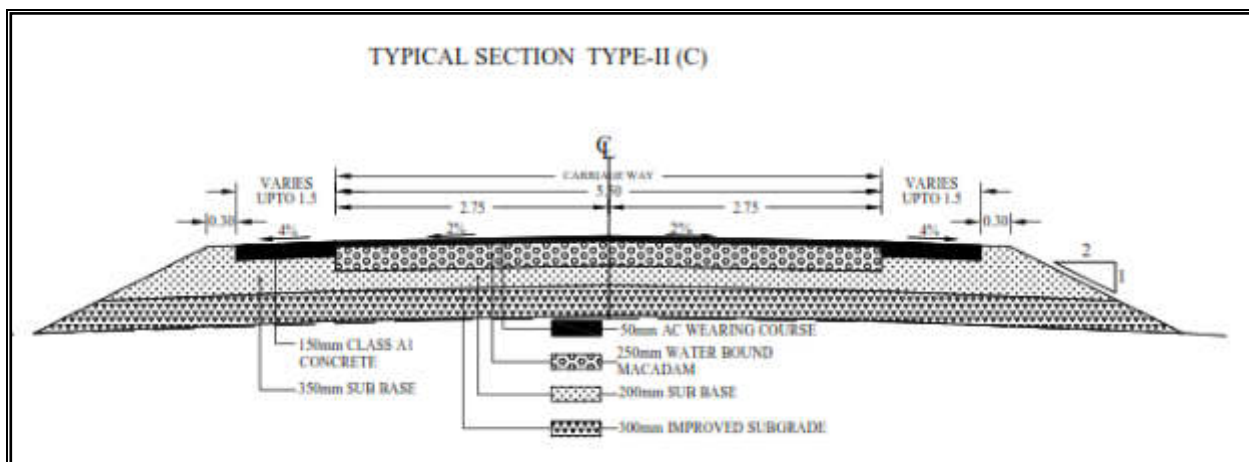


Figure 3-9: Type-II (C) Typical Cross Section

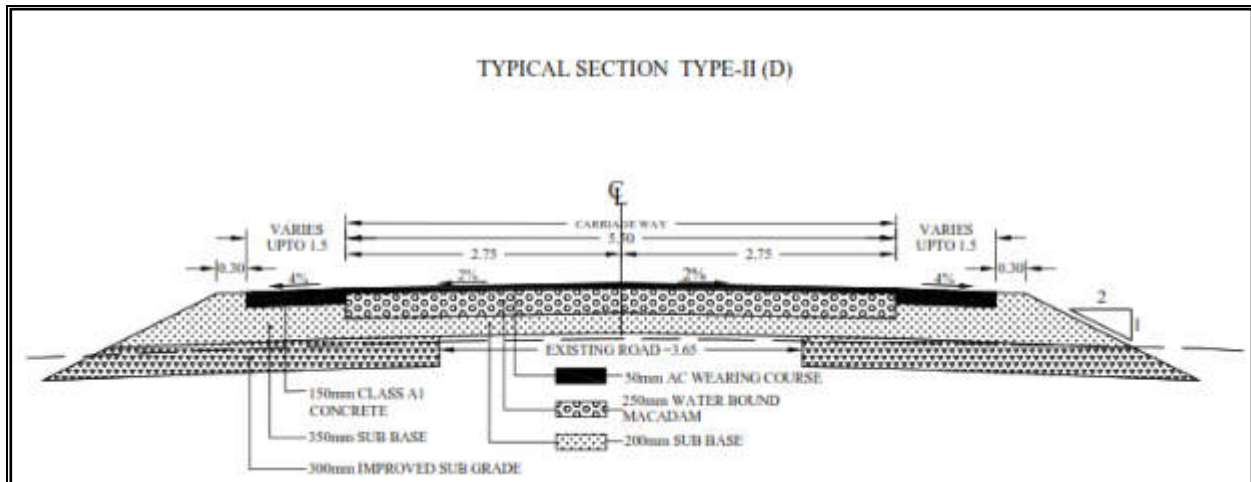


Figure 3-10: Type-II (D) Typical Cross Section

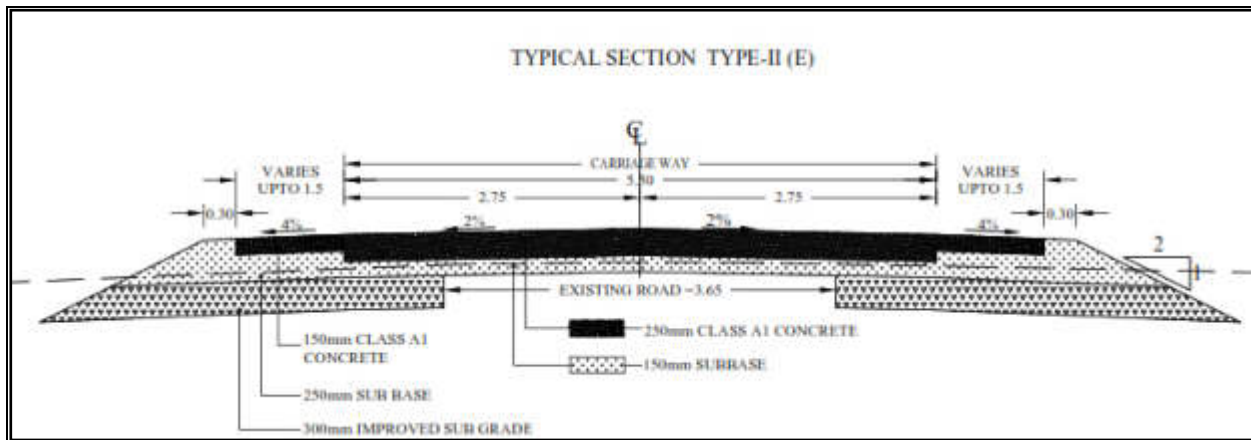


Figure 3-11: Type-II (E) Typical Cross Section

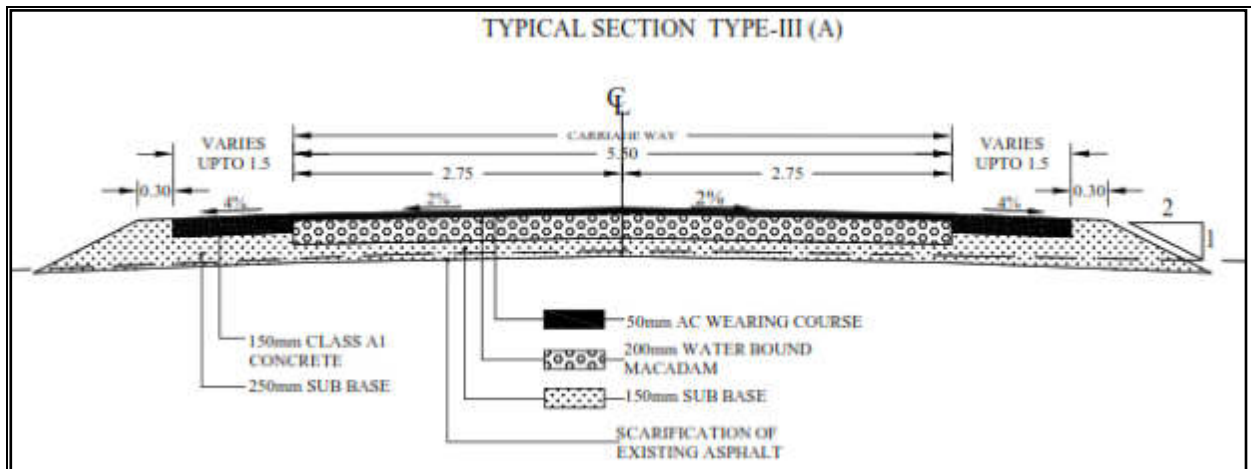


Figure 3-12: Type-III (A) Typical Cross Section

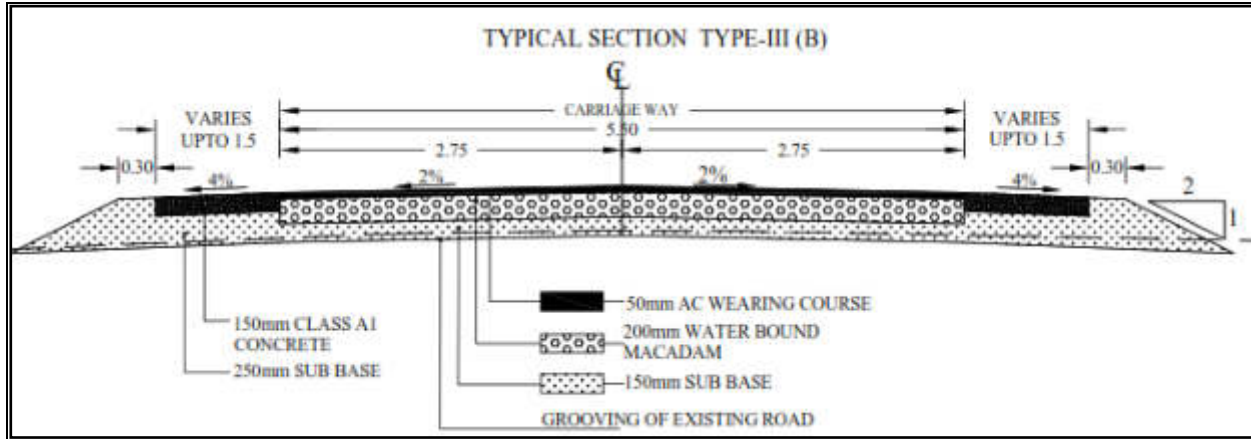


Figure 3-13: Type-III (B) Typical Cross Section

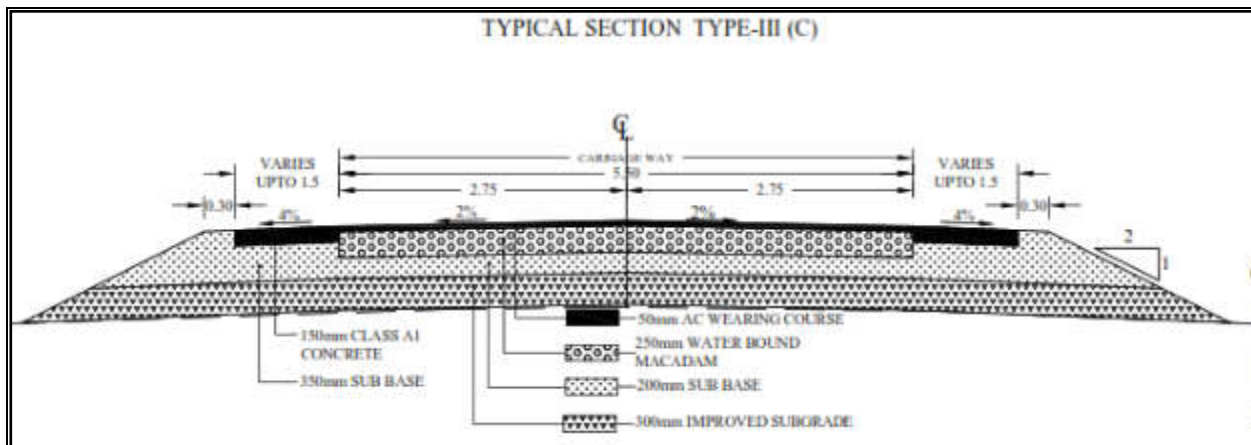


Figure 3-14: Type-III (C) Typical Cross Section

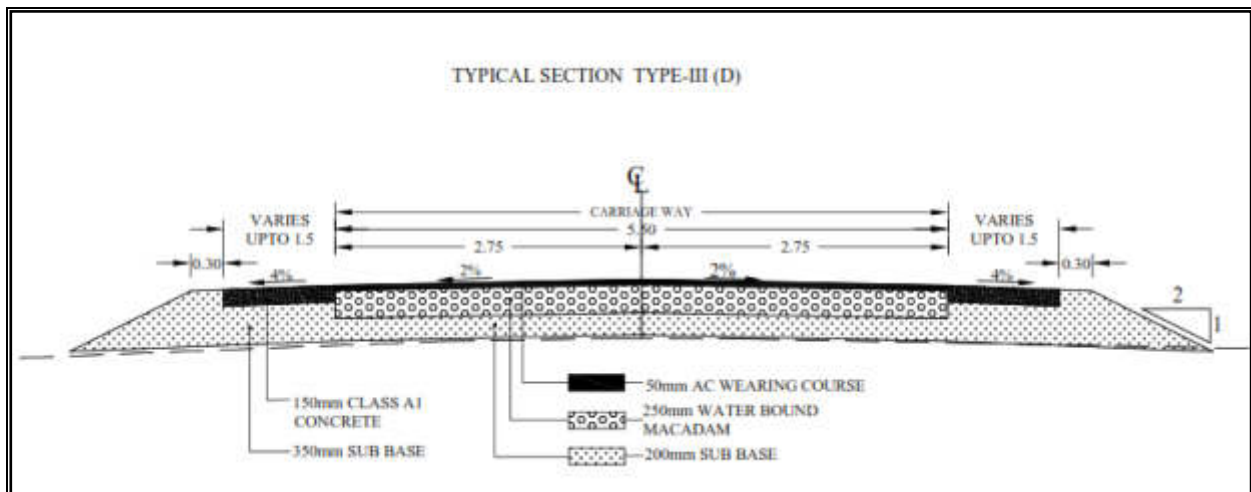


Figure 3-15: Type-III (D) Typical Cross Section

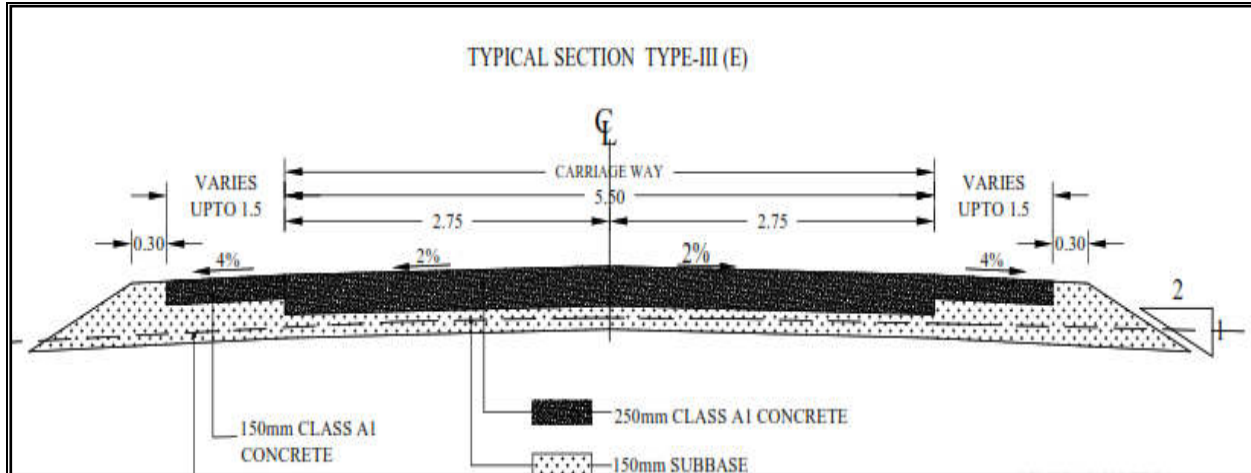


Figure 3-16: Type-III (E) Typical Cross Section

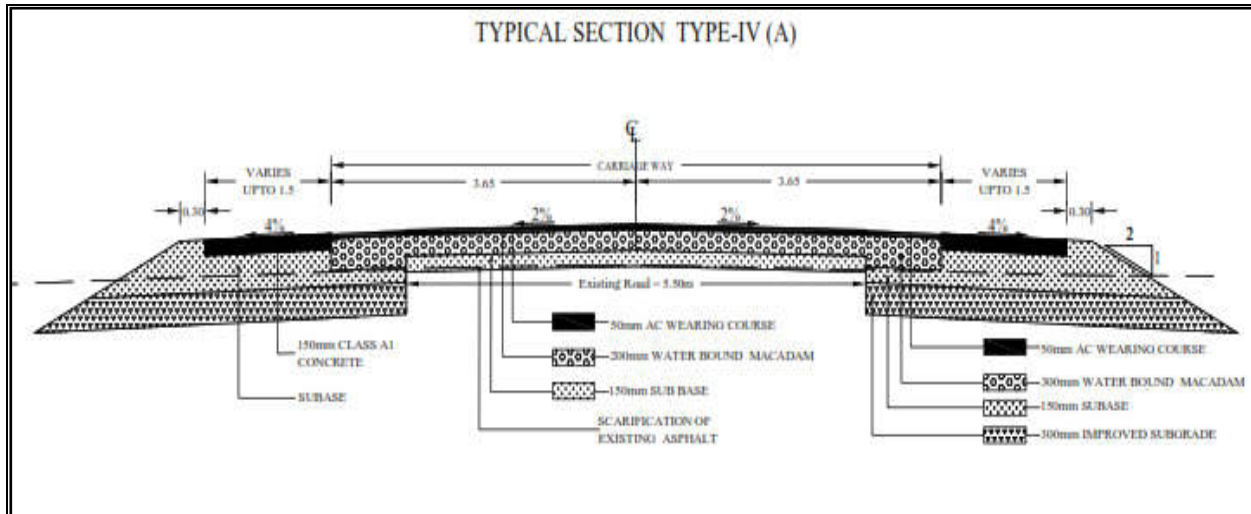


Figure 3-17: Type-IV (A) Typical Cross Section

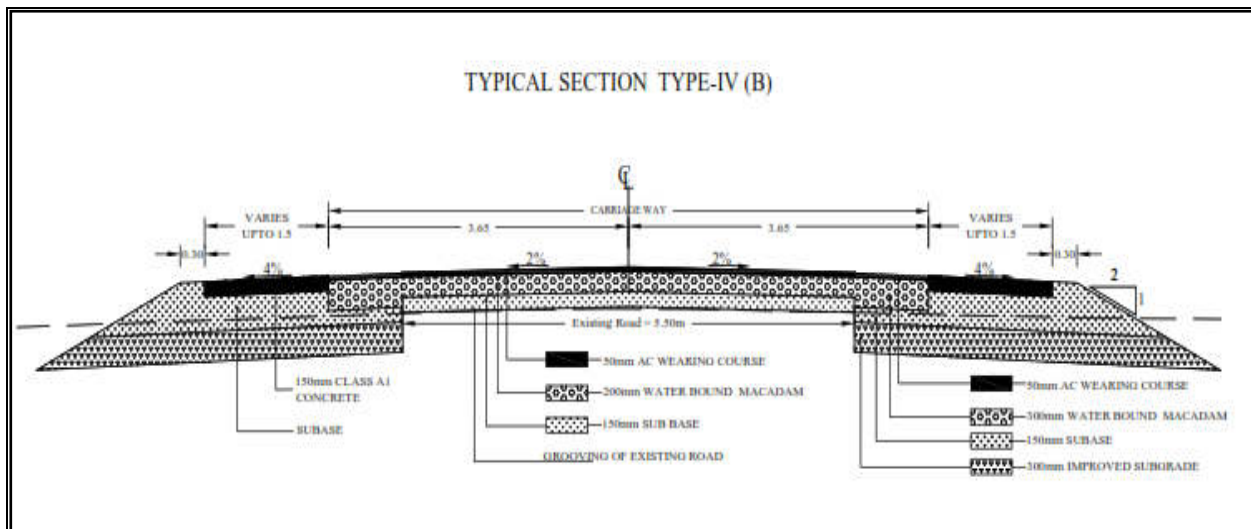


Figure 3-18: Type-IV (B) Typical Cross Section

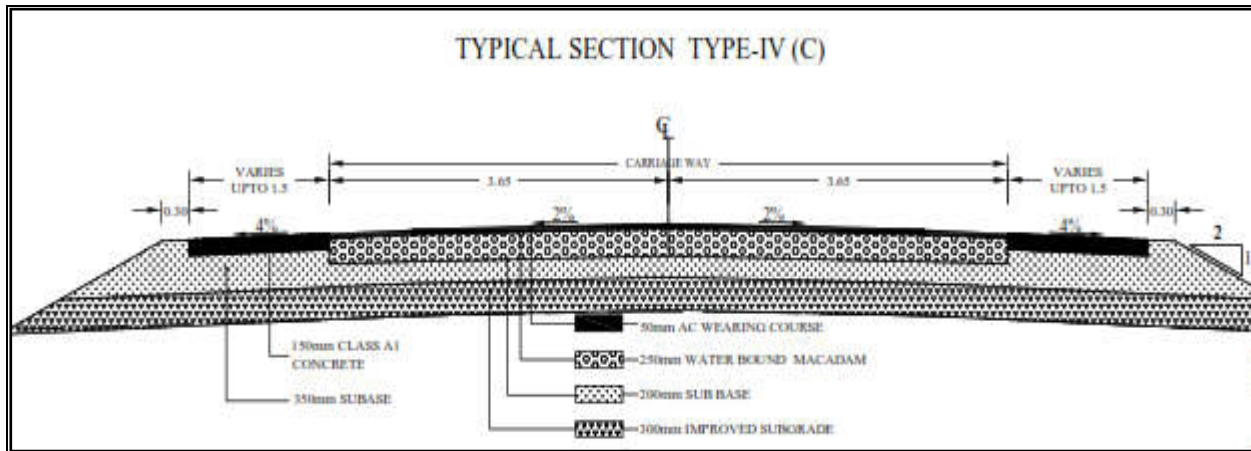


Figure 3-19: Type-IV (C) Typical Cross Section

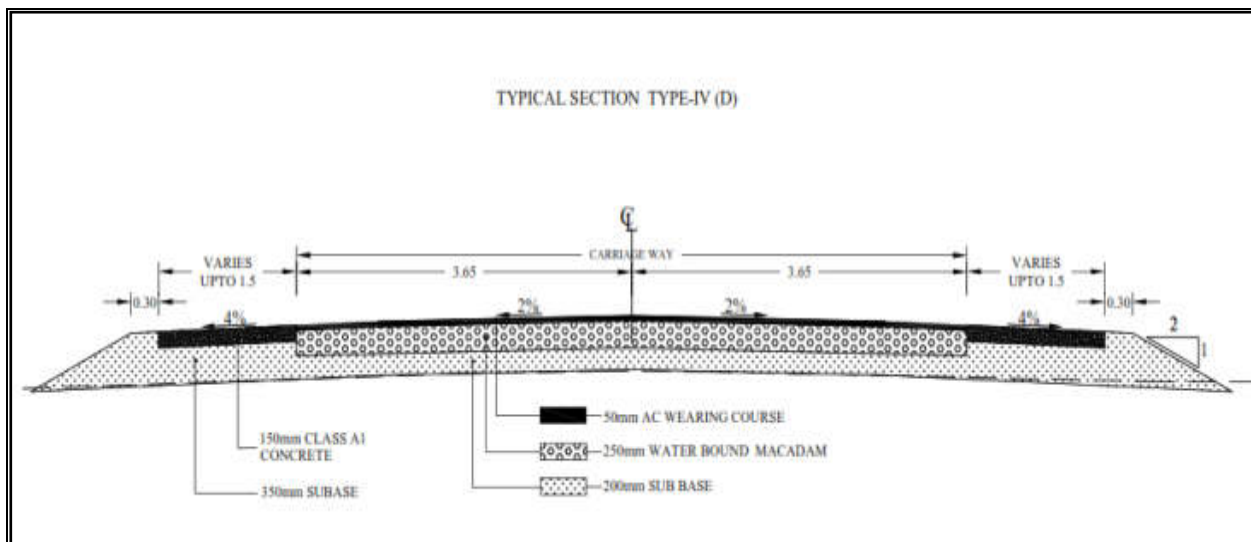


Figure 3-20: Type-IV (D) Typical Cross Section

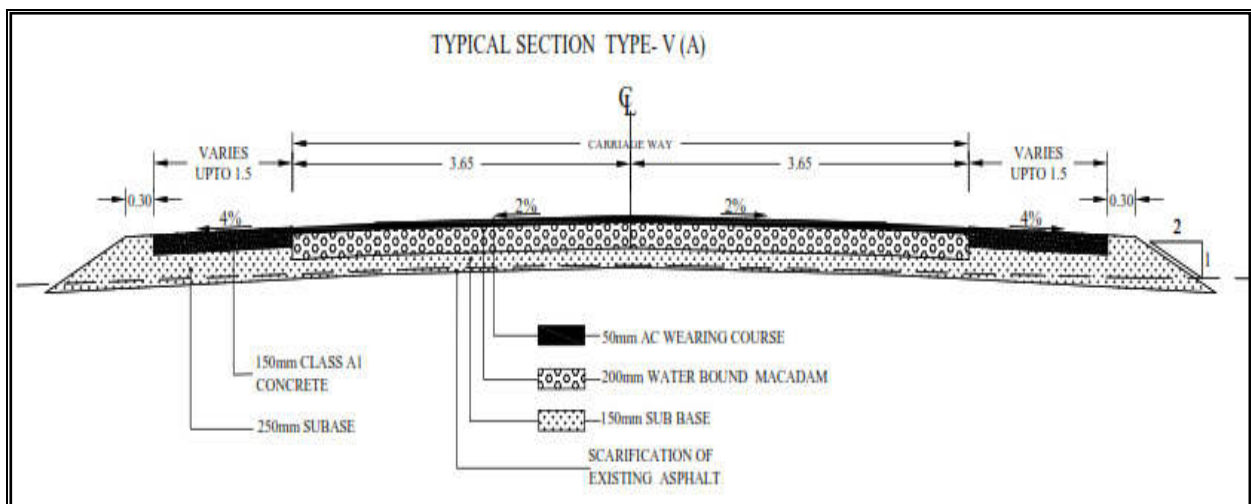


Figure 3-21: Type-V (A) Typical Cross Section

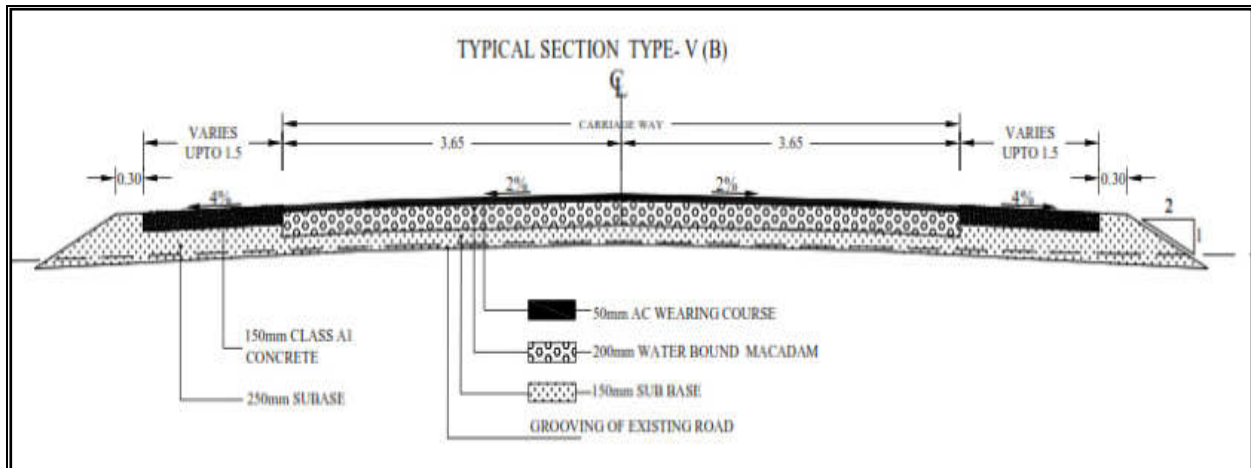


Figure 3-22: Type-V (B) Typical Cross Section

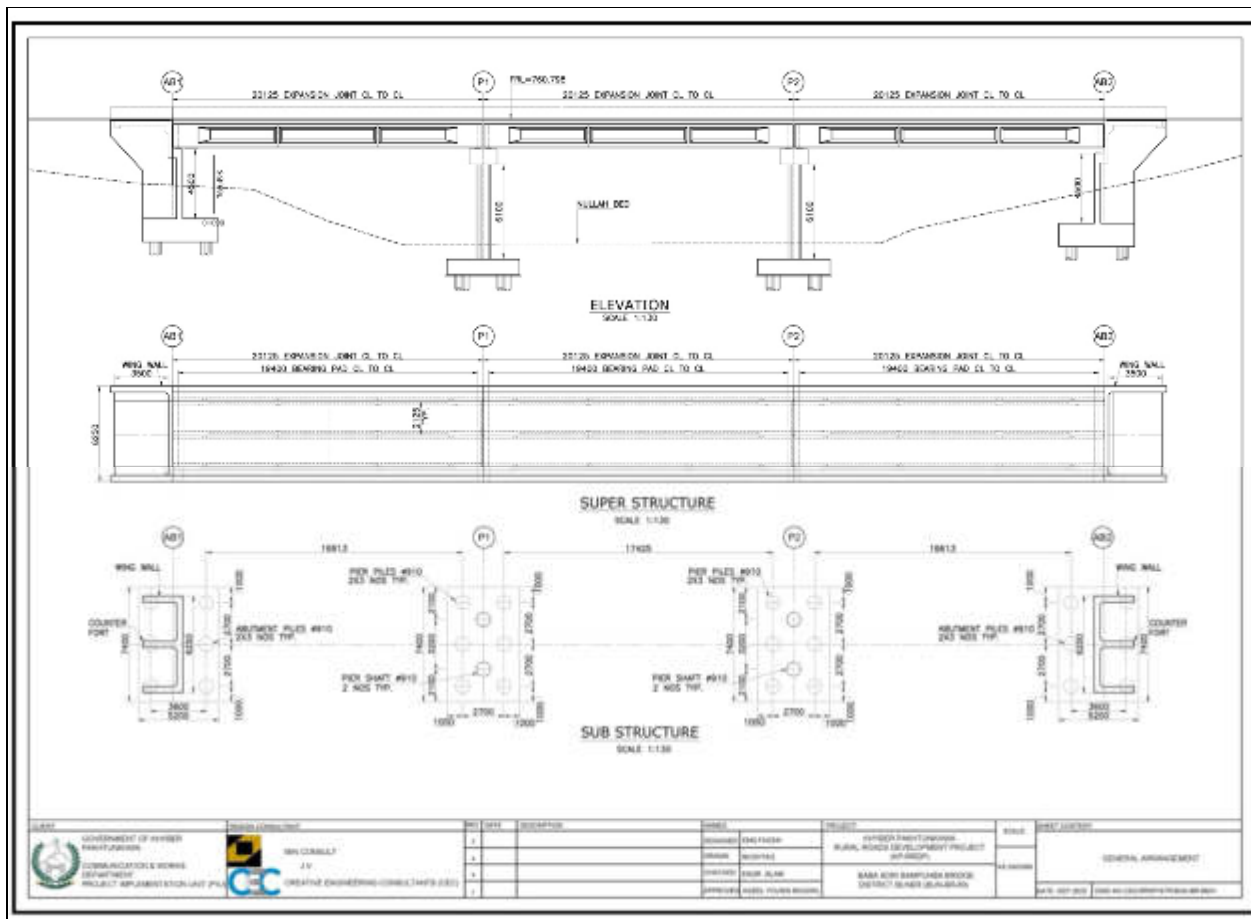
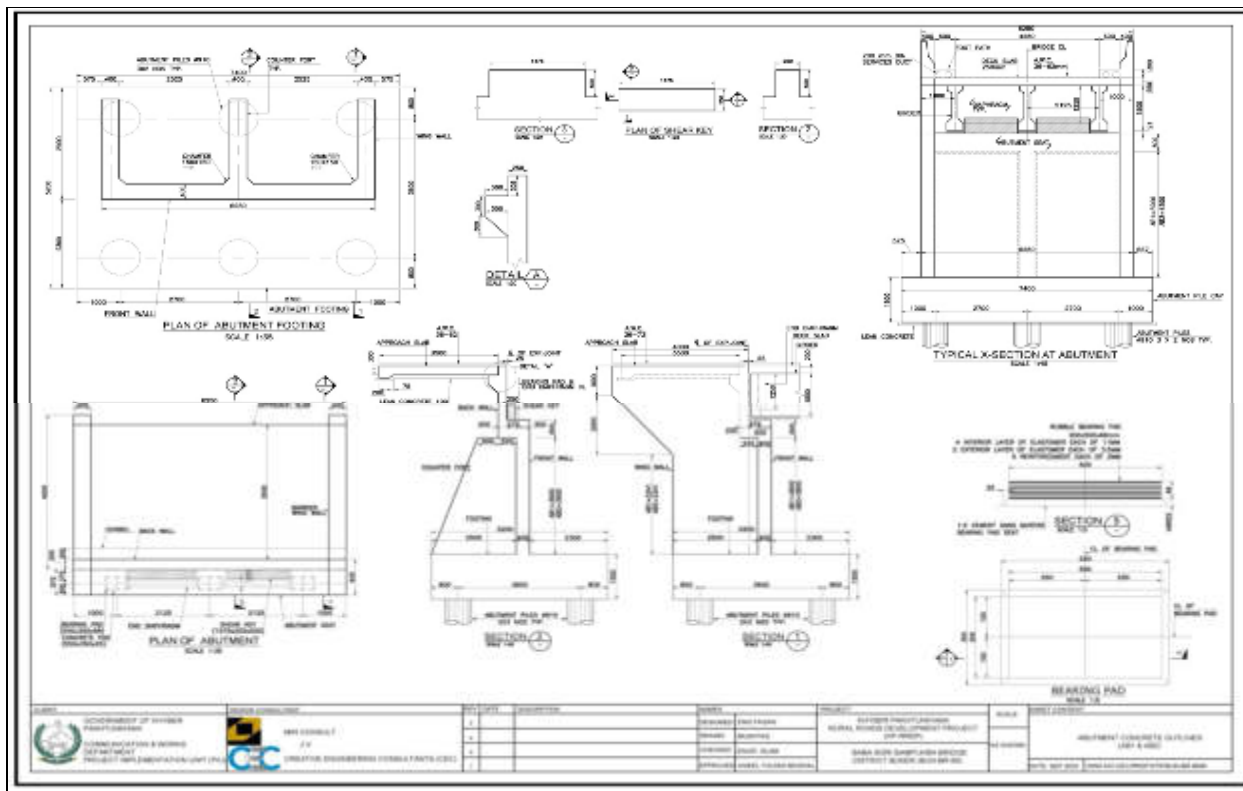


Figure 3-23: Type-V (B) Typical Cross Section-Bridge BUN-89

[Handwritten Signature]
 Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar



3.9 Quantities

3.9.1 Earth Works

96. Earth work includes to clearing grubbing, roadway excavation, formation of embankment etc. National Highway Authority General Specifications is trailed for all the activities pertaining to Earth Work during roads and bridges rehabilitation (table 3.3).

Table 3-2: Earth Work Estimates

Name	Clearing and Grubbing	Compaction of Natural Ground	Excavate Unsuitable Common Material	Formation of embankment from borrow excavation in common materials	Formation of embankment from road way excavation in common materials					
						Estimated Cumulative Quantities				
						m ²		m ³		
Roads	12,325,300	9,513,200	1,109,750	1,786,650	7,803,800					
Bridges	--	--	--	--	11,500					

Source: BOQ with quantities (rounded off)

3.9.2 Road Works

97. Road works includes mainly construction of rigid, concrete and asphaltic pavement, variable at different types of roads. All the activities pertaining to roads works during road

construction are executed as per guidelines set in National Highway Authority General Specifications (table 3.4).

Table 3-3: Road Works (Sub-base and base course)

Grooving of existing roads pavement	Concrete Class A on ground	Aggregate base
Estimated Cumulative Quantities		
m²	m³	
9,546,500	933,550	8,013,000

Source: BOQ with quantities rounded off

98. The quantities for surface course and pavement works are given in table 3.5.

Table 3-4: Surface course and pavement

Bituminous Prime coat	Bituminous Tack Coat	Asphalt Concrete for Wearing Course
Estimated Cumulative Quantities		
m²		m³
1564,800	213,550	3,453,250

Source: BOQ with quantities rounded off

3.10 Activity Phases

99. The following is a sequential description of the potential activities associated with the construction of the project.

3.11 Pre-Construction Phase

3.11.1 Demolition/ Relocation

100. This involves the removal of obstacles along the route, such as bushes, electric poles, lighting poles, and water pipes, which must be coordinated with various utility agencies such as water and sanitation agencies, water and power development authority (WAPDA), tehsil municipal administration etc. To demolish the utility system that obstructs the construction before proceeding with the construction. It will be the responsibility of the project client (KP C&W) to provide the clear right of way to the contractor.

3.11.2 Construction of work facilities

101. Construction of construction control offices, workers' houses, and maintenance workshops. It is the construction of various semi-permanent buildings, including:

- **Construction supervision offices and worker house:** construction of semi-permanent buildings in the construction area including the construction supervision office and construction worker house. These facilities may be rented house or the areas where the supervision staff can accommodate during the implementation of the project. The criteria for contractor camp site will be 300m away from any residential dwelling and sensitive receptors in case numerous staff is to stay in the camp. It is estimated that around 34 number of the supervision staff office will be established for the proposed project.
- **Contractor Camp:** The criteria for contractor camp site will be 300m away from any residential dwelling and sensitive receptors. The contractor will establish around 72 camp sites (sites are yet to be finalize) as per the convenience and as per work plan

of the subprojects. However, criteria of 300m will be met by the contractor of the subprojects to avoid any social inconvenience. The locations of the sites are not yet known; however, the contractor will establish their camps as per the convenience of work plan prior to get permission from the supervision consultants and PIU. These sites will be reflected in the site-specific environment management plans of each contract.

- In case of rented house as camp site, the contractor will fence the walls of the house and will display a board showing the house is being used as camp site. This criterion will be followed for all roads and bridges.
- **Labor Camps:** The majority of the labor force will come from the local areas. Some semi-skilled and skilled workers may have to be brought in by contractor from far off towns and will live in camps. Being located near the work base, the camps will make the work access easy to the camp dwellers. Like the camps, the work base will also be 300m away from the nearest habitation, water resources and sensitive receptors. These sites will be reflected in the site-specific environment management plans of each contract. Before finalizing the labor camp site, the contractor will obtain the permission from the Engineer and PIU.
- It is anticipated that 18,000 persons (for all roads and bridges) will be directly hired during the full construction stage. In contractor camp and labor camp, necessary environmental management infrastructure will be introduced, such as septic tank and/or other wastewater treatment facility, waste disposal area, chemicals storage, first aid facility, drinking water, etc. This criterion will be followed for all roads and bridges.
- **Construction of concrete foundry/asphalt concrete mix plant and repair shop Machine Maintenance:** Construction of a semi-permanent building is separate from the construction of a concrete foundry to be used as a place to mix concrete including carrying out activities related to the casting of precast concrete structural parts. Asphalt concrete mixing plant construction for asphalt concrete mixing plant for maintenance plant construction is intended to be used as a maintenance facility during construction. It can also be used as a temporary storage area. When the construction is complete, all buildings will be demolished from the area. A repair workshop is essential to maintain the vehicles and other machinery required for project and subproject. The contractor may establish own workshop at place approved by the Engineer and PIU prior to its establishment. The machinery maintenance and equipment yard will be at designated place to be used only for workshop purposes. No construction vehicle will be allowed to park at road. The asphalt plant shall be at least five hundred meters away while the batching plant will be 300m away from the any population dwellings, water resources and sensitive receptors. This criterion will be followed for all roads and bridges.
- **Material Depots:** Near the work base material depot will be required for storing construction material. It will have temporary sheds for storing cement, steel and asphalt and open space for storing stones, shingles and bricks. The material depots will be walled and gate will be provided with ample security. A store keeper will keep account of incoming and outgoing materials. This criterion will be followed for all roads and bridges.
- **Security Arrangements:** Security staff is necessary in some subproject areas such as DI Khan and Karak. Adequate security will be required at contractor's camp, labor camp, material store, equipment yards and location of the work in progress on the work site. The contractor will make necessary arrangements for security at site in

coordination with nearby law enforcing agencies. This criterion will be followed for all roads and bridges.

- **Labor Transport:** Almost all of the unskilled labor will be employed from local area. This will also keep the camps less pressurized and manageable. The transport of the labor will be restricted till the sunset, during the night time travelling permission will be required from the concerned resident engineer or contractor subproject manager. This criterion will be followed for all roads and bridges.
- **Labor Reporting Office:** Along the roads and in work bases special areas will be marked where the labor can gather at the time of pick and drop, emergency or briefing and places will be clearly marked and kept open and clean and as per requirement will be equipped with public address system.
- **Healthcare:** With a sizable number of labor and employees working in the project and subproject, small injuries or accidents are expected to take place on all construction sites. A dispensary will be set by the contractors within each base camp. This dispensary will be operated by the contractors with fulltime paramedics. For major cases the patients will be shifted to the nearest District Hospital under a pre-coordinated arrangement. This criterion will be followed for all roads and bridges.
- **Dispensary:** The contractor will establish one dispensary (one for each road) where paramedical staff will be available full time while a doctor working on a part time basis will also be available. This criterion will be followed for all roads and bridges.

3.12 Machinery to be used

102. The machinery likely to be use in the project are graders, batching plants, asphalt mixing plants and others as given in table 3.6.

Table 3-5: Machinery Requirement (Estimated Cumulative Quantities)

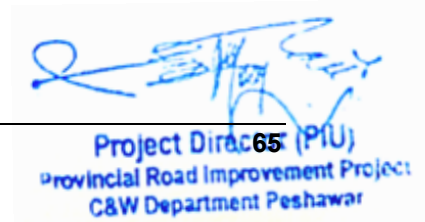
Machinery	Roads	Bridges
Graders	190	25
Tractors	184	15
Vibratory Rollers	110	19
Water Bowser/Sprinklers	92	14
Haulage Trucks	110	4
Excavators / Loaders	92	-
Small Vehicles Dozers	92	-

Source: BOQ of the Project

103. Additionally, the Contractors will require concrete and asphalt. These maybe procured from licensed facilities, or the contractor may wish to establish his own plant, depending on the required volumes.

3.13 Personal Protective Equipment (PPE) and Health Safety Equipment

104. Road construction is a special job and the labor working on such work requires special protective uniforms and special HSE measures. It will be ensured that the labor engaged in breaking of stones, handling bricks, mixing concrete or mixing and laying asphalt will have long boots, overall, goggles, gloves, ear mufflers, safety jackets, safety hats etc. As an overall HSE measure all construction workers and anyone going into the construction area will use necessary PPE.



3.14 Signage

105. During construction suitable signboards and traffic signs will be displayed on the construction sites in particular and on the entire roads length as well as at the bridges in general. This will help in forestalling any possible accidents.

3.15 Lighting and Illumination

106. Suitable lighting arrangement will be made by the contractor over all work base, work sites, camp site, machinery yard and material depots. This can help the contractor for extended working hours as well as security. In case electricity supply is not available, electricity generators will have to be arranged on all spots where lighting is required. This criterion will be followed for all roads and bridges. This criterion will be followed for all roads and bridges.

4 BASELINE ENVIRONMENTAL CONDITIONS

4.1 Corridor of Impact (COI)

107. The COI extends beyond the actual right-of-way (RoW) of the project roads and bridges to encompass the broader region where positive and adverse impacts may arise from their construction. This area of influence includes various elements, such as relocations, access roads, borrow and disposal areas, construction camps, and any unplanned developments induced by the project, like spontaneous settlements or logging activities. The design team conducted route optimization based on the available road alignments, aiming to identify and address potential sensitive physical, ecological, and socio-economic constraints at the project locations. The bridges and road’s rehabilitation works in terms of formation width or construction limits, the project’s corridor of impact (COI) is thus strictly limited to the existing and available width of carriageway and within the government owned official right of way (RoW). However, for the purpose of environmental assessment 250m distance on each side from center line of the roads and bridges was selected as COI.

4.2 Physical Environment

4.2.1 Topography

108. Khyber Pakhtunkhwa (KPK), boasts a diverse and captivating topography that reflects the region's geographical richness. The topography of KPK is divided into three main geographical divisions. Rugged mountainous regions in the north and west are dominated by the Hindu Kush Mountains, Himalayas, and the Dir, Swat, and Kohistan Ranges. The rehabilitation of roads and bridges of the proposed project spans across twenty-one districts of KPK.
109. The topography of the overall project is variable at hilly areas like Chitral, Kohistan, Dir, Battagram it varies from minimum 1264.10 masl (BTG-2) to maximum at 3310.23masl at N-CHT-6, table 4-1.
110. For Plain terrain such as Charsadda, Swabi, Bannu, DI. khan kohat etc varies from minimum 510.10 masl at T2 to maximum at 993.51 masl at RRD-DIK R3, table 4-1, figure 4-1.

Table 4-1: Topographic Elevations of Roads in Project Area

Sr. No.	Road ID and Name	Minimum Elevation (m)	Maximum Elevation (m)
Access Roads			
1	BN-3: Rehabilitation of Alla Khel to Havid Road in Bannu	658.6	679.33
2	BN-5: Rehabilitation of Durrani Chowk to Piran Titter Khel Road in Bannu	620.22	686.25
3	N-BN-1: Rehabilitation of Alla Khel to Mir Sher Khan Chowk via Havid Road in Bannu	590.12	616.55
4	N-BN-11: Reconstruction of Village Waligai Uc Zaraki Pirba Khel Road in Bannu	589.72	631.43
5	BTG-16: Rehabilitation of Rajdari to Kathora Road I/C Link Road in Battagram	1264.74	1324.91
6	BTG-2: Rehabilitation of road Kandara to Sokar Chilar in Battagram	1164.10	1248.32

Sr. No.	Road ID and Name	Minimum Elevation (m)	Maximum Elevation (m)
7	N-BUN-2: Rehabilitation of Bababir to Manga Thana to Nagarai Road in Bunner	1141.90	1378.91
8	BUN-11: Rehabilitation of Jangdara Bato road in District Bunner	1091.33	1208.77
9	BUN-9: Rehabilitation of Girari road in Bunner	1033.93	1189.91
10	CHR-9: Rehabilitation of Takhtbhai Road to Malang Abad in Charsada	934.99	1001.44
11	CHR-10: Rehabilitation of Road from Sardheri Bazar to Nisata via Zarin Abad in Charsada	994.89	1051.94
12	N-CHT-2: Rehabilitation of Osaic to Orsoon road in District Chitral	2982.89	3172.71
13	DRL-35: Rehabilitation of Mula Hukam Baba to Sro Gul Khero Shah road in lower Dir.	2712.10	2879.11
14	T-30: Rehabilitation of road to Sar Banda Munjai Top in lower Dir	2712.43	2879.42
15	T-31: Rehabilitation of road to Pantolo Picnic Spot in lower Dir	2340.23	2509.14
16	N-KRK-R2: Rehabilitation of road from Takhate Nasrati Bridge to Khadda Banda via Bhogara Culvert Rose Baig Khail Kalah in District Karak	656.78	796.90
17	KOHAT-3: Rehabilitation of road from Mukarab Khan Korona to Kot Road in District Kohat	722.87	810.66
18	N-KOHAT-3: Rehabilitation of Khusal Garh Road to Kamar Dhoke in District Kohat	692.20	797.16
19	CHR-4: Rehabilitation of road from Landi Shah to Narrai Uba in Malakand.	810.66	918.76
20	MLK-7: Rehabilitation of road Neher Quarter to Jaban Power House in District Malakand	798.88	924.80
21	MLK-4: Rehabilitation of Mura Banda Link road in Malakand	801.10	894.40
22	N-MLK-1: Rehabilitation of Daragai-Palai Interchange Swat Motorway in District Malakand	1189.80	1218.29
23	N-MLK-2: Rehabilitation of road from Badranga to Jazoon Dag Road in District Malakand	1208.89	1328.88
24	SNG-14: Rehabilitation of road from Chakesar Nebi More to Said Abad in District Shangla	1008.12	1128.22
25	SNG-61: Rehabilitation of Miankalay Pagorai Kas Road in Shangla	1118.44	1230.35
26	SNG-20: Rehabilitation of Towa Chowkai Asharkot Road in Shangla	1098.92	1188.52
27	SNG-26: Rehabilitation of Aluch Bunirwall Road in Shangla	1198.84	1310.10
28	SNG-28: Rehabilitation of Bengalai Landai Balo Chawak Road in Shangla	1184.80	1290.80
29	SNG-30: Rehabilitation of Dherai Faiza Sondvi Road in Shangla	1197.87	1379.19
30	SNG-27: Rehabilitation of Main Dara in District Shangla	1209.10	1399.16
31	SNG-29: Rehabilitation of Chagum Gumbat Road in District Shangla	1134.31	1310.26
32	SNG-63: Rehabilitation of Alpurai Barkas Kag Road in District Shangla	1207.17	1399.39
33	SNG-22: Rehabilitation of Chagam Alamay Road in District Shangla	1098.22	1329.81

Sr. No.	Road ID and Name	Minimum Elevation (m)	Maximum Elevation (m)
34	SNG-7: Rehabilitation of Martung Chakisar Road in District Shangla	1027.17	1389.49
35	SNG-60: Rehabilitation of Rahimabad Kas Basi Road in District Shangla	1088.87	1329.13
36	SNG-33: Rehabilitation of Zara Road in District Shangla	1127.17	1379.15
37	TGH-1: Rehabilitation of Karrak Madakhel to Hasan Zai Road in District Tor Garh	1137.17	1319.49
Tourism Roads			
38	T-1: Rehabilitation of Rani Ghat Road in District Bunner	1113.45	1298.92
39	N-CHT-9: Rehabilitation of Pashty Road, Pret to Pashty Valley in District Chitral	2910.12	3071.72
40	DRL-4: Rehabilitation of Ouch Kotigram Local Road in Dir Lower	2713.12	2899.12
41	T-3: Rehabilitation of Road to Laram Top in Dir Lower	2610.12	2780.32
42	T-42: Rehabilitation of Road to Sheen Ghar Top in Dir Upper	2910.12	3022.45
43	T-43: Rehabilitation of Road from in Uthror to Thal via Badgoi Top Dir Upper	2890.10	3022.45
44	T-35: Rehabilitation of Nara Akhoonkhail Waterfall Road in Haripur	971.90	1082.88
45	T-7: Rehabilitation of Noori Water Fall Road in Haripur	945.80	1092.10
46	HRI-17: Rehabilitation of Anar Gah Road in Haripur	1001.90	1090.99
47	MAN-2: Rehabilitation of Shingri Road in Mansehra	1093.98	1178.10
48	T-12: Rehabilitation of Road to Saiful Maluk Lake in Mansehra	1390.90	1598.11
49	T-22: Rehabilitation of Road to Sharan Forest in Mansehra	1460.90	1596.90
50	T-2: Rehabilitation of Beer Gali Road in Swabi	510.10	596.90
51	SWT-5: Rehabilitation of Kalam Banr Shahoo Road in Swat	2458.90	2598.10
52	T-19: Rehabilitation of Beshai Meadows Raod in Swat	2418.94	2794.87
53	T-4: Rehabilitation of Kandol Lake Paristan Lake in Swat	2480.91	2790.78
54	N-SWT-T-2: Rehabilitation of Taip Banda Road in Swat	2456.71	2789.90
55	N-SWT-T4: Rehabilitation of Road from Uthror to Thal via Badgoi Top in Swat.	2489.90	2810.10
56	N-SWT-T3: Rehabilitation of Raod from Desan Meadows to Kalam in Swat	2670.10	3010.98
Flood Affected			
57	RRD_UCH_NR1: Rehabilitation of Oveer road in Chitral	2918.12	3211.71
58	N-CHT-1: Rehabilitation of Shesha to Madalcasht road in Chitral	2898.22	3180.72
59	N-CHT-5: Rehabilitation of Arkari Valley road in Chitral	2910.28	3285.22
60	N-CHT-6: Rehabilitation of Tirch road from Nishko bridge to Shahgroom Tirch, Chitral	2980.90	3310.23
61	N-CHT-7: Rehabilitation of Rech road in Chitral	2893.21	3142.71
62	KPR_DIK_NR11: Rehabilitation of Main N-50 to Shero Kuhna road in D.I.khan	810.10	901.34
63	KPR_DIK_NR13: Main N-55 road to Diyal via Airport and CRBC Colony, D.I. khan	820.12	921.14
64	RRD_DIK_R1: Rehabilitation of Prova to Chowdwan road in D.I.khan	835.19	993.55
65	RRD_DIK_R2: Rehabilitation of Kulachi to Luni road in D.I.khan	799.10	911.30

Sr. No.	Road ID and Name	Minimum Elevation (m)	Maximum Elevation (m)
66	RRD_DIK_R4: Rehabilitation of Mian Kasirai Shareef road (Darazinda) in D.I.khan	810.10	901.34
67	RRD_DIK_R6: Rehabilitation of Parwara jalal Khell road (Darazinda) in D.I.Khan	792.30	923.41
68	RRD_DIK_R7: Rehabilitation of Main Daraban road to Kot Walidad via Garah Khan	788.52	910.65
69	RRD_DIK_NR4: Rehabilitation of Indus highway to Dhok Rabnawaz and Chah Hussain road in D.I.khan	778.44	891.61
70	RRD_DIK_NR5: Rehabilitation of Chashma road, Thathal Adda to Phahar pur old Canal road Via Mubarak shah & Thatha in D.I.khan	771.92	899.35
71	RRD_DIK_NR6: Rehabilitation of road from Chashma road to village Musa khar and Jabbar wala in D.I.khan	731.12	840.65
72	RRD_DIK_NR7: Rehabilitation of Awan Nala Civil Minor road in D.I.khan	781.55	900.15
73	RRD_DIK_NR8: Rehabilitation of road from CRBC Canal to Diyal Paharpur Canal road & Rehmat Abad Link in D.I.khan road	798.52	950.91
74	RRD_DIK_NR9: Rehabilitation of Pusha Pul to Garrah Rehman in D.I.khan	819.88	950.35
75	RRD_DIK_NR12: Rehabilitation of Jhandi Sewaag Road in D.I.khan	756.52	891.34
76	RRD_DIK_NR10: Rehabilitation of Main N-55 road to Sadra Sharif Road in D.I.khan	767.90	890.90
77	RRD_DIK_NR14: Rehabilitation of Giloti Road in D.I.khan	791.32	958.29
78	RRD_DRL_NR1: Rehabilitation of Shorshing Jakra Baba Road	798.52	950.91
79	RRD_DRU_R1: Link Roads Usheraai Dara	1095.19	1118.56
80	RRD_DRU_NR3: Rehabilitation of Katigram to Shagai U/C Kotke	1015.20	1190.13
81	RRD_DRU_NR4: Rehabilitation of Sundrai to Qadarkandow Road (Nehag Dara)	990.19	1098.89
82	KPR_KRK_NR5: Rehabilitation of Hamdan to Inzar More in Karak	719.89	810.19
83	RRD_KRK_R1: Rehabilitation of Indus Highway to Nari Khawar in Karak	729.87	818.90
84	RRD_KRK_R3: Rehabilitation of Payala More to Shahidan Banda in Karak	710.91	831.87
85	RRD_LKH_R1: Rehabilitation of Batera Road in Lower Kohistan	916.90	1087.10
86	RRD_LKH_R2: Rehabilitation Pattan Ziarat Road (Seer Gazi Abad to Kharat) in Lower Kohistan	941.90	1167.90
87	RRD_LKH_R1: Rehabilitation of Masham Road in Lower Kohistan	891.98	987.78
88	RRD_LKH_R4: Rehabilitation of Chawa Darra Road and Renolia Road Tehsil, Bunkat, Ronolia in Lower Kohistan	949.91	1097.94
89	RRD_UKH_R1: Rehabilitation of Jalkot Goshali Road 1: Gabber Nullah Road in Upper Kohistan	949.30	1088.90

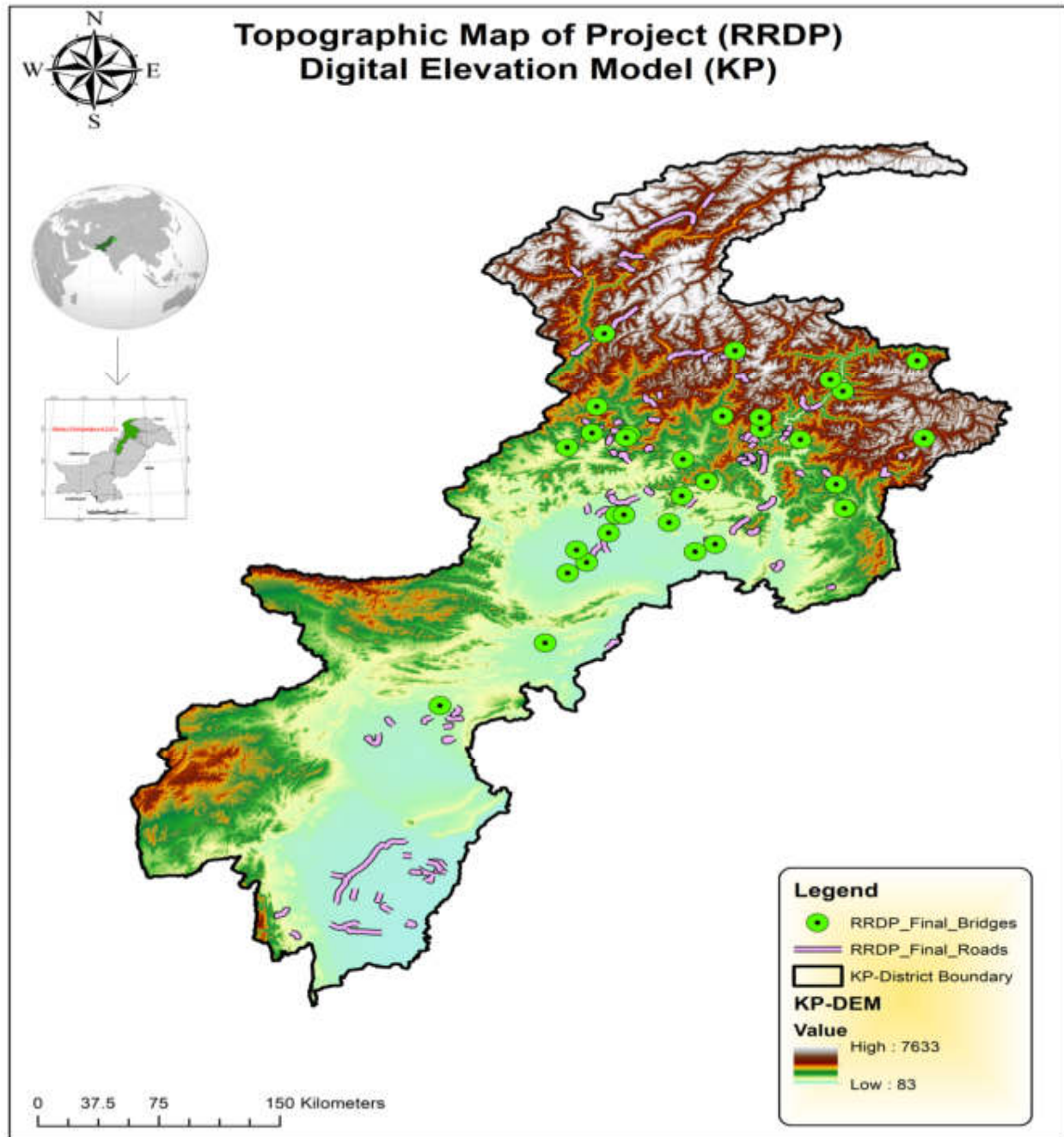


Figure 4-1: Showing the Locations of Project Roads and Bridges at Different Elevations

4.2.2 Geology and Soil

111. The soil and geology of KPK vary significantly across its different zones due to the diverse geological history and landscapes.

- Northern zone encompasses the Hindu Kush, Swat Range, and Karakoram Range, characterized by rugged mountains, steep slopes, and deep valleys.
- Central KPK lies between the northern and southern mountains, consisting of valleys and plains formed by the deposition of sediments from the surrounding mountains.

- Southern zone borders the Indus River plain and consists of relatively flat plains and terraces with occasional hills.
112. The soil in KPK Pakistan, is diverse due to the varied topography and climatic conditions in the region. The province encompasses a range of soil types in different zones.
- In northern zone the soil primarily consists of Skeletal leptosols and Cambisols, characterized by shallow depth, low organic matter content, and coarse texture.
 - Central KPK comprises mainly Fluvisols and Cambisols. Fluvisols are young, fertile alluvial soils deposited by rivers, while Cambisols are moderately developed soils with moderate fertility.
 - While in Southern KPK, soil mainly consists of Fluvisols and Vertisols. Fluvisols are fertile alluvial soils, while Vertisols are clay-rich soils with high shrink-swell potential. These soils are suitable for various agricultural activities.

4.2.3 Seismic Activity/Seismicity

113. Khyber Pakhtunkhwa (KPK) lies in a seismically active region due to its proximity to the Hindu Kush Mountain range. The project area falls in various types of the earth quack zone such as minor to no damage area in DI Khan, Banu, Karak, and moderate to severe area such as Chitral, Swat. The seismic activity of Khyber Agency, Mohmand Agency, and Charsadda district is relatively low compared to other parts of Pakistan. The design consideration such as improved strength are given especially in the moderate to severe damage areas.
114. Among 89 roads the roads falling in DI. Khan, Kohat, Karak, Charsadda (such as BN-3, BN-5, BN-11, CHR-9: CHR-10, N-KRK-R2, RRD_DIK_NR4, RRD_DIK_R7, RRD_DIK_NR12, RRD_DIK_NR14, RRD_DIK_NR10, KPR_KRK_NR5 etc), are present in minor to moderate damage areas as per the seismic map of Pakistan.
115. Some roads are present in moderate to severe zone of seismicity, such as BTG-2, BTG-16, T-31, N-MLK-1, SNG-61, SNG-20, SNG-26, SNG-28, SNG-30, SNG-27, SNG-7, N-CHT-9, T-35, SWT-5, RRD_UCH_NR1, N-CHT-5, N-CHT-6, N-CHT-7, these roads are designed keeping in view the seismicity of the subproject areas. For details refer to table 4-2 figure 4-2.

Table 4-2: Table showing the Seismic Zone of Each Road

Sr. No.	Road ID and Name	District	Seismic Zones
1	BN-3: Rehabilitation of Alla Khel to Havid Road in Bannu	Bannu	2B
2	BN-5: Rehabilitation of Durrani Chowk to Piran Titter Khel Road in Bannu	Bannu	2B
3	N-BN-1: Rehabilitation of Alla Khel to Mir Sher Khan Chowk via Havid Road in Bannu	Bannu	2B
4	N-BN-11: Reconstruction of Village Waligai Uc Zaraki Pirba Khel Road in Bannu	Bannu	2B
5	BTG-16: Rehabilitation of Rajdari to Kathora Road I/C Link Road in Battagram	Battagram	3
6	BTG-2: Rehabilitation of road Kandari to Sokar Chilar in Battagram	Battagram	3
7	N-BUN-2: Rehabilitation of Bababir to Manga Thana to Nagarai Road in Bunner	Bunner	2B
8	BUN-11: Rehabilitation of Jangdara Bato road in District Bunner	Bunner	2B
9	BUN-9: Rehabilitation of Girari road in Bunner	Bunner	2B

Sr. No.	Road ID and Name	District	Seismic Zones
10	CHR-9: Rehabilitation of Takhtbhai Road to Malang Abad in Charsada	Charsada	2B
11	CHR-10: Rehabilitation of Road from Sardheri Bazar to Nisata via Zarin Abad in Charsada	Charsada	2B
12	N-CHT-2: Rehabilitation of Osaic to Orsoon road in District Chitral	Chitral	4
13	DRL-35: Rehabilitation of Mula Hukam Baba to Sro Gul Khero Shah road in lower Dir.	lower Dir	3
14	T-30: Rehabilitation of road to Sar Banda Munjai Top in lower Dir	lower Dir	3
15	T-31: Rehabilitation of road to Pantolo Picnic Spot in lower Dir	lower Dir	3
16	N-KRK-R2: Rehabilitation of road from Takhate Nasrati Bridge to Khadda Banda via Bhogara Culvert Rose Baig Khail Kalah in District Karak	Karak	2B
17	KOHAT-3: Rehabilitation of road from Mukarab Khan Korona to Kot Road in District Kohat	Kohat	2B
18	N-KOHAT-3: Rehabilitation of Khusal Garh Road to Kamar Dhoke in District Kohat	Kohat	2B
19	CHR-4: Rehabilitation of road from Landi Shah to Narrai Uba in Malakand.	Malakand	3
20	MLK-7: Rehabilitation of road Neher Quarter to Jaban Power House in District Malakand	Malakand	3
21	MLK-4: Rehabilitation of Mura Banda Link road in Malakand	Malakand	3
22	N-MLK-1: Rehabilitation of Daragai-Palai Interchange Swat Motorway in District Malakand	Malakand	3
23	N-MLK-2: Rehabilitation of road from Badranga to Jazoon Dag Road in District Malakand	Malakand	3
24	SNGL-14: Rehabilitation of road from Chakesar Nebi More to Said Abad in District Shangla	Shangla	3
25	SNGL-61: Rehabilitation of Miankalay Pagorai Kas Road in Shangla	Shangla	3
26	SNGL-20: Rehabilitation of Towa Chowkai Asharkot Road in Shangla	Shangla	3
27	SNGL-26: Rehabilitation of Aluch Bunirwall Road in Shangla	Shangla	3
28	SNGL-28: Rehabilitation of Bengalai Landai Balo Chawak Road in Shangla	Shangla	3
29	SNGL-30: Rehabilitation of Dherai Faiza Sondvi Road in Shangla	Shangla	3
30	SNGL-27: Rehabilitation of Main Dara in District Shangla	Shangla	3
31	SNGL-29: Rehabilitation of Chagum Gumbat Road in District Shangla	Shangla	3
32	SNGL-63: Rehabilitation of Alpurai Barkas Kag Road in District Shangla	Shangla	3
33	SNGL-22: Rehabilitation of Chagam Alamay Road in District Shangla	Shangla	3
34	SNGL-7: Rehabilitation of Martung Chakisar Road in District Shangla	Shangla	3
35	SNGL-60: Rehabilitation of Rahimabad Kas Basi Road in District Shangla	Shangla	3
36	SNGL-33: Rehabilitation of Zara Road in District Shangla	Shangla	3
37	TGH-1: Rehabilitation of Karrak Madakhel to Hasan Zai Road in District Tor Garh	Tor Garh	3
38	T-1: Rehabilitation of Rani Ghat Road in District Bunner	Bunner	2B
39	N-CHT-9: Rehabilitation of Pashty Road, Pret to Pashty Valley in District Chitral	Chitral	4
40	DRL-4: Rehabilitation of Ouch Kotigram Local Road in Dir Lower	Dir Lower	3
41	T-3: Rehabilitation of Road to Laram Top in Dir Lower	Dir Lower	3
42	T-42: Rehabilitation of Road to Sheen Ghar Top in Dir Upper	Dir Upper	3
43	T-43: Rehabilitation of Road from in Uthror to Thal via Badgoi Top Dir Upper	Dir Upper	3
44	T-35: Rehabilitation of Nara Akhoonkhail Waterfall Road in Haripur	Haripur	2B
45	T-7: Rehabilitation of Noori Water Fall Road in Haripur	Haripur	2B
46	HRI-17: Rehabilitation of Anar Gah Road in Haripur	Haripur	2B

Sr. No.	Road ID and Name	District	Seismic Zones
47	MAN-2: Rehabilitation of Shingri Road in Mansehra	Mansehra	3
48	T-12: Rehabilitation of Road to Saiful Maluk Lake in Mansehra	Mansehra	3
49	T-22: Rehabilitation of Road to Sharan Forest in Mansehra	Mansehra	3
50	T-2: Rehabilitation of Beer Gali Road in Swabi	Swabi	2B
51	SWT-5: Rehabilitation of Kalam Banr Shahoo Road in Swat	Swat	3
52	T-19: Rehabilitation of Beshai Meadows Raod in Swat	Swat	3
53	T-4: Rehabilitation of Kandol Lake Paristan Lake in Swat	Swat	3
54	N-SWT-T-2: Rehabilitation of Taip Banda Road in Swat	Swat	3
55	N-SWT-T4: Rehabilitation of Road from Uthror to Thal via Badgoi Top in Swat.	Swat	3
56	N-SWT-T3: Rehabilitation of Raod from Desan Meadows to Kalam in Swat	Swat	3
57	RRD_UCH_NR1: Rehabilitation of Oveer road in Chitral	Chitral	4
58	N-CHT-1: Rehabilitation of Shesha to Madalcasht road in Chitral	Chitral	4
59	N-CHT-5: Rehabilitation of Arkari Valley road in Chitral	Chitral	4
60	N-CHT-6: Rehabilitation of Tirch road from Nishko bridge to Shahgroom Tirch, Chitral	Chitral	4
61	N-CHT-7: Rehabilitation of Rech road in Chitral	Chitral	4
62	KPR_DIK_NR11: Rehabilitation of Main N-50 to Shero Kuhna road in D.I.khan	D.I.khan	2B
63	KPR_DIK_NR13: Main N-55 road to Diyal via Airport and CRBC Colony, D.I. khan	D.I.khan	2B
64	RRD_DIK_R1: Rehabilitation of Prova to Chowdwan road in D.I.khan	D.I.khan	2B
65	RRD_DIK_R2: Rehabilitation of Kulachi to Luni road in D.I.khan	D.I.khan	2B
66	RRD_DIK_R4: Rehabilitation of Mian Kasirai Shareef road (Darazinda) in D.I.khan	D.I.khan	2B
67	RRD_DIK_R6: Rehabilitation of Parwara jalal Khell road (Darazinda) in D.I.Khan	D.I.khan	2B
68	RRD_DIK_R7: Rehabilitation of Main Daraban road to Kot Walidad via Garah Khan	D.I.khan	2B
69	RRD_DIK_NR4: Rehabilitation of Indus highway to Dhok Rabnawaz and Chah Hussain road in D.I.khan	D.I.khan	2B
70	RRD_DIK_NR5: Rehabilitation of Chashma road, Thathal Adda to Phahar pur old Canal road Via Mubarak shah & Thatha in D.I.khan	D.I.khan	2B
71	RRD_DIK_NR6: Rehabilitation of road from Chashma road to village Musa khar and Jabbar wala in D.I.khan	D.I.khan	2B
72	RRD_DIK_NR7: Rehabilitation of Awan Nala Civil Minor road in D.I.khan	D.I.khan	2B
73	RRD_DIK_NR8: Rehabilitation of road from CRBC Canal to Diyal Paharpur Canal road & Rehmat Abad Link in D.I.khan road	D.I.khan	2B
74	RRD_DIK_NR9: Rehabilitation of Pusha Pul to Garrah Rehman in D.I.khan	D.I.khan	2B
75	RRD_DIK_NR12: Rehabilitation of Jhandi Sewaag Road in D.I.khan	D.I.khan	2B
76	RRD_DIK_NR10: Rehabilitation of Main N-55 road to Sadra Sharif Road in D.I.khan	D.I.khan	2B
77	RRD_DIK_NR14: Rehabilitation of Giloti Road in D.I.khan	D.I.khan	2B
78	RRD_DRL_NR1: Rehabilitation of Shorshing Jakra Baba Road	D.I.khan	3
79	RRD_DRU_R1: Link Roads Usherai Dara	Dir Lower	3
80	RRD_DRU_NR3: Rehabilitation of Katigram to Shagai U/C Kotke	Dir upper	3
81	RRD_DRU_NR4: Rehabilitation of Sundrai to Qadarkandow Road (Nehag Dara)	Dir upper	3
82	KPR_KRK_NR5: Rehabilitation of Hamdan to Inzar More in Karak	Karak	2B

Sr. No.	Road ID and Name	District	Seismic Zones
83	RRD_KRK_R1: Rehabilitation of Indus Highway to Nari Khawar in Karak	Karak	2B
84	RRD_KRK_R3: Rehabilitation of Payala More to Shahidan Banda in Karak	Karak	2B
85	RRD_LKH_R1: Rehabilitation of Batera Road in Lower Kohistan	Lower Kohistan	3
86	RRD_LKH_R2: Rehabilitation Pattan Ziarat Road (Seer Gazi Abad to Kharat) in Lower Kohistan	Lower Kohistan	3
87	RRD_LKH_R1: Rehabilitation of Masham Road in Lower Kohistan	Lower Kohistan	3
88	RRD_LKH_R4: Rehabilitation of Chawa Darra Road and Renolia Road Tehsil, Bunkat, Ronolia in Lower Kohistan	Lower Kohistan	3
89	RRD_UKH_R1: Rehabilitation of Jalkot Goshali Road 1: Gabber Nullah Road in Upper Kohistan	Upper Kohistan	3

Seismic zoning
BCP - PGA (m/sq. sec)
 Zone 1 (<0.8), Zone 2A (0.8 - 1.6), Zone 2B (1.6 - 2.4), Zone 3 (2.4 - 3.2), Zone 4 (> 3.2)

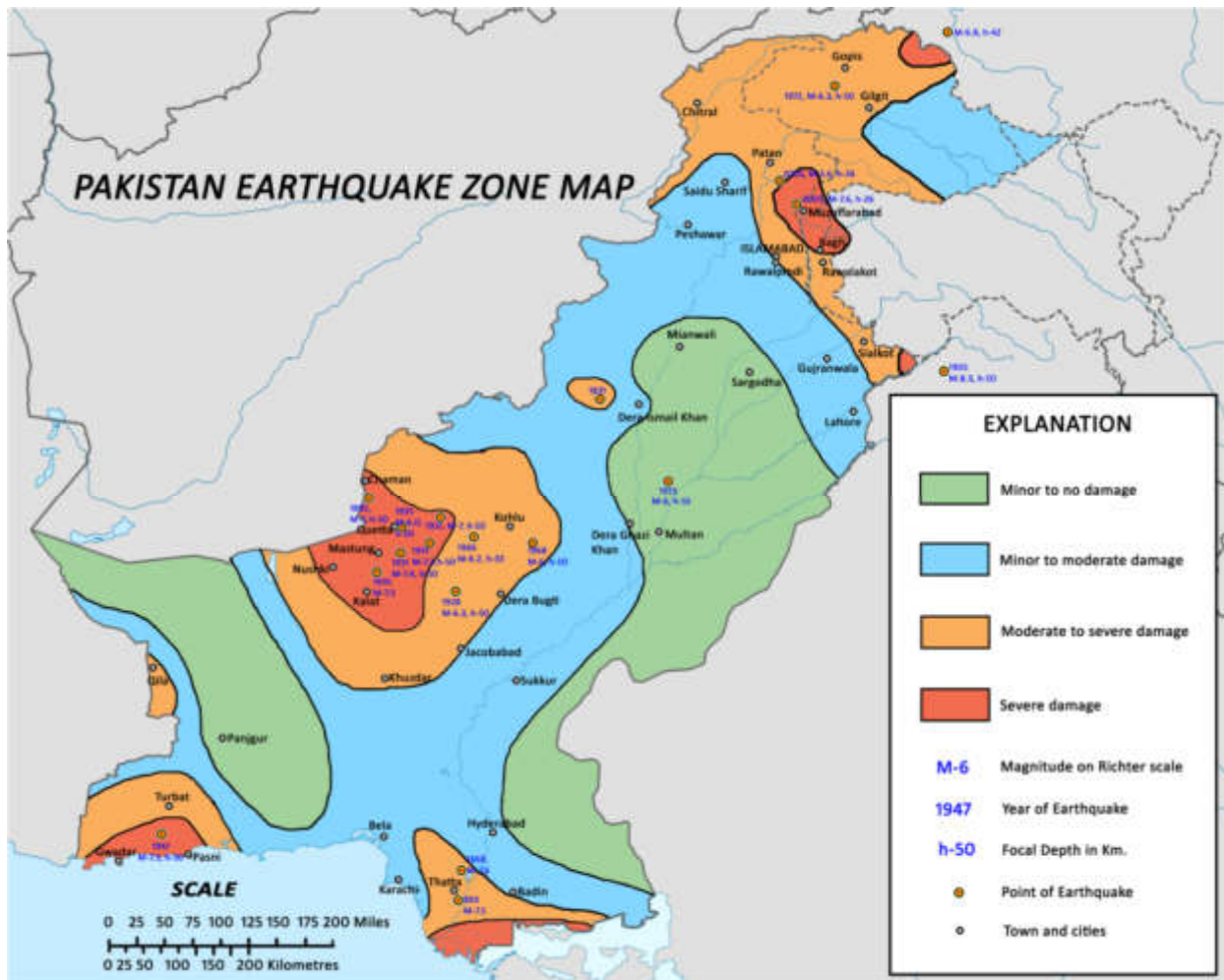


Figure 4-2: Earthquake zoning map

4.2.4 Climate, Temperature and Rainfall

116. The proposed project is located in twenty-one different districts of KP. These districts are located in different zones of KP. These zones are Northern, Central, Southern, and Western KPK.

- **Northern KPK:** Batagram, Bunner, Shangla, and Torghar
- **Central KPK:** Charsadda, Dir, Peshawar, and Swabi
- **Southern KPK:** Bannu, Karak, Kohat, and DI Khan
- **Western KPK:** Kohistan, Chitral, Mansehra, Mardan, Nowshera, and Swat
- Southern KP tends to experience the hottest summers in KP, with average temperatures exceeding 35°C in June, July, and August. Winters are mild, with average temperatures above 10°C in December, January, and February.
- Northern KP located in the mid-elevations of the Hindu Kush mountains, experience warm summers with average temperatures in the mid-20s to low-30s from June to August. Winters are cold, with average temperatures below 0°C in December, January, and February (figure 4-2)

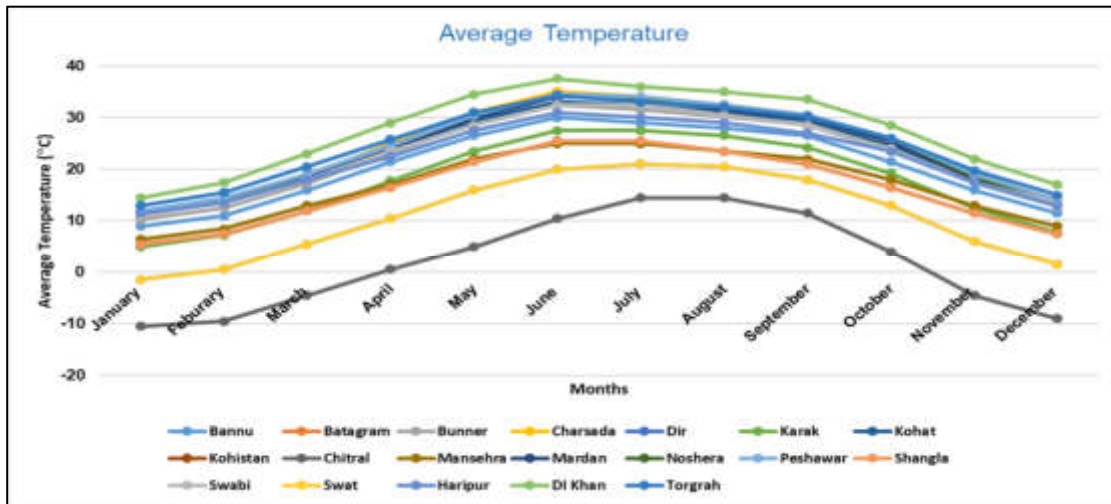


Figure 4-3: Average Temperature at Proposed Locations

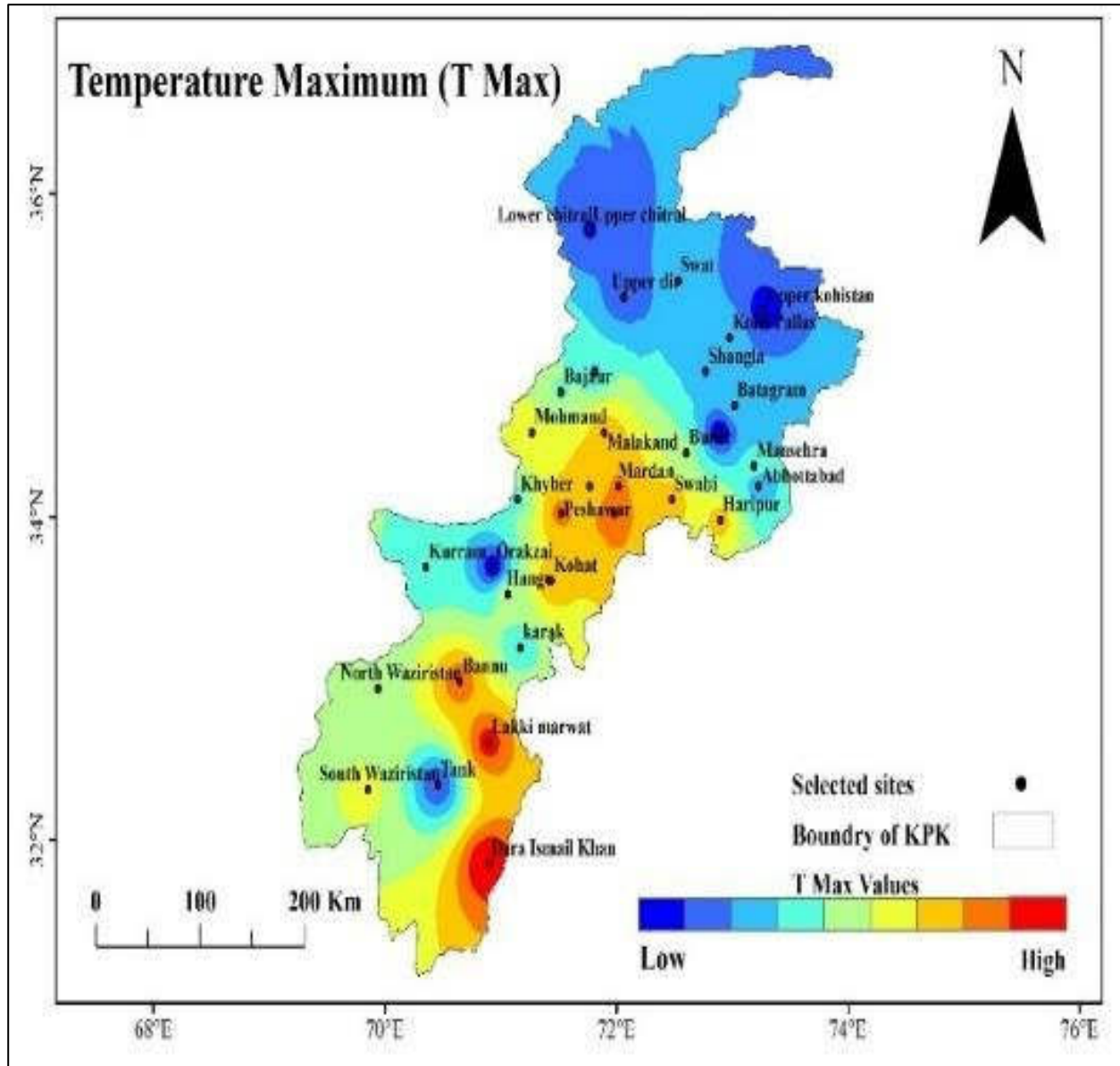


Figure 4-4: Map showing Maximum Temperature in KPK

- Central KP experience hot summers, with average temperatures exceeding 30°C in June, July, and August. Winters are mild, with average temperatures above 5°C in December, January, and February.
 - Western KPK experience cool summers with average temperatures in the mid-20s to low-30s from June to August. Winters are cold, with average temperatures below 0°C in December, January, and February.
117. The average rainfall in KPK varies considerably throughout the year and across the different zones. Bannu, Karak, Kohat, and DI Khan (Southern Zone) receive the least amount of rainfall throughout the year, with an average of less than 50 millimeters per month. Northern Zone receives more rainfall than the southern zones, with an average of 50 to 100 millimeters per month. Central KPK receive a moderate amount of rainfall, with

an average of 100 to 150 millimeters per month. However, western zone receives the most rainfall throughout the year, with an average of 150 to 200 millimeters per month.

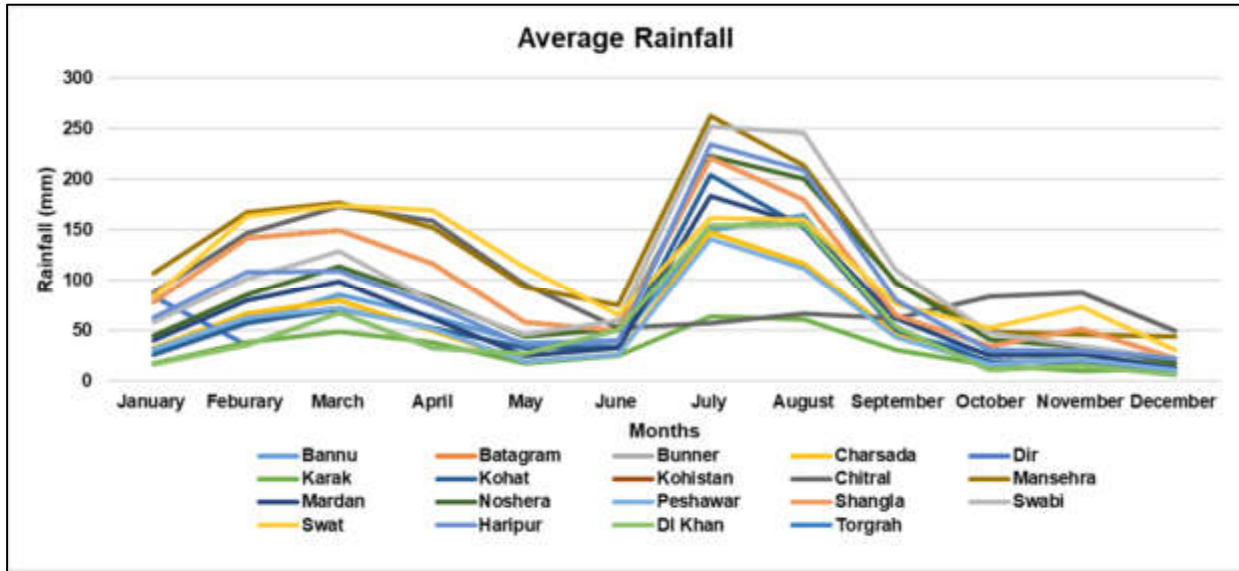


Figure 4-5: Average Rainfall at Project Area

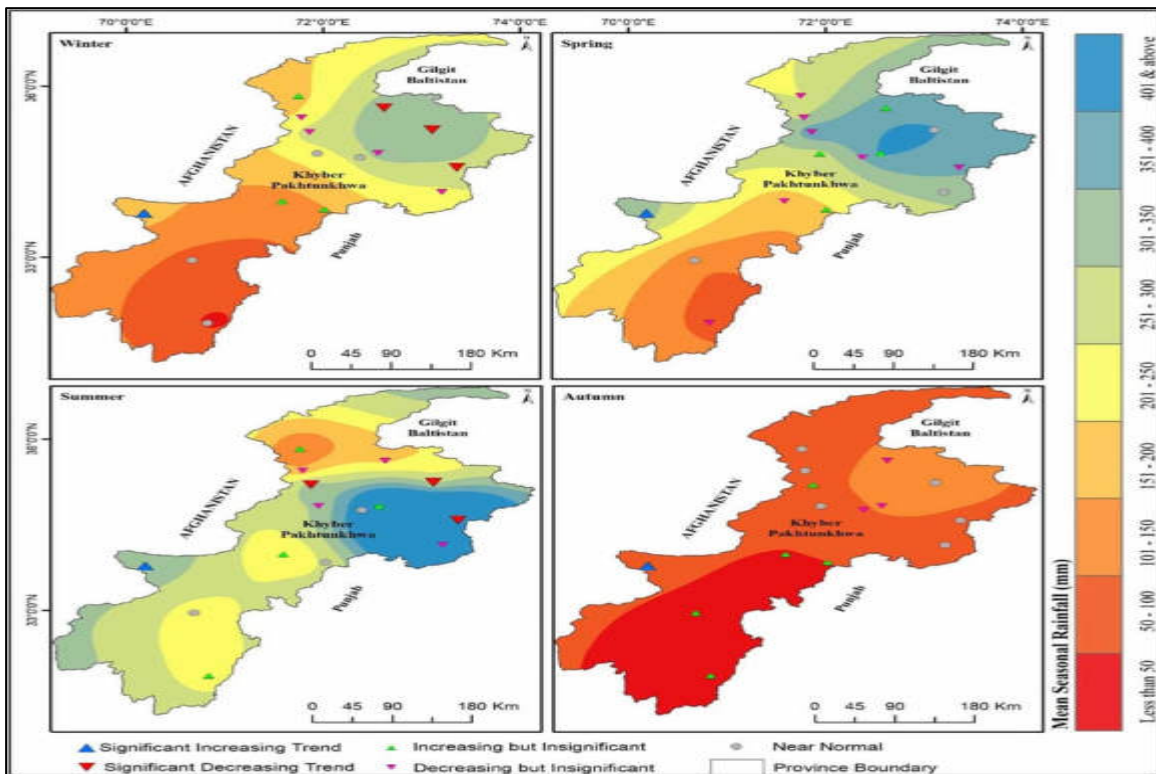


Figure 4-6: Map of Rainfall Trends in KPK

118. The project is dispersed across all zones within KP, with the majority of snowfall occurring in the northern regions of the province. Chitral and Kohistan, experiences the most significant snowfall in the province. These areas are located in the high mountains of the

Hindu Kush range and receive an average of 5 to 10 cm or even over 10 cm of snowfall during winter months (December to March).

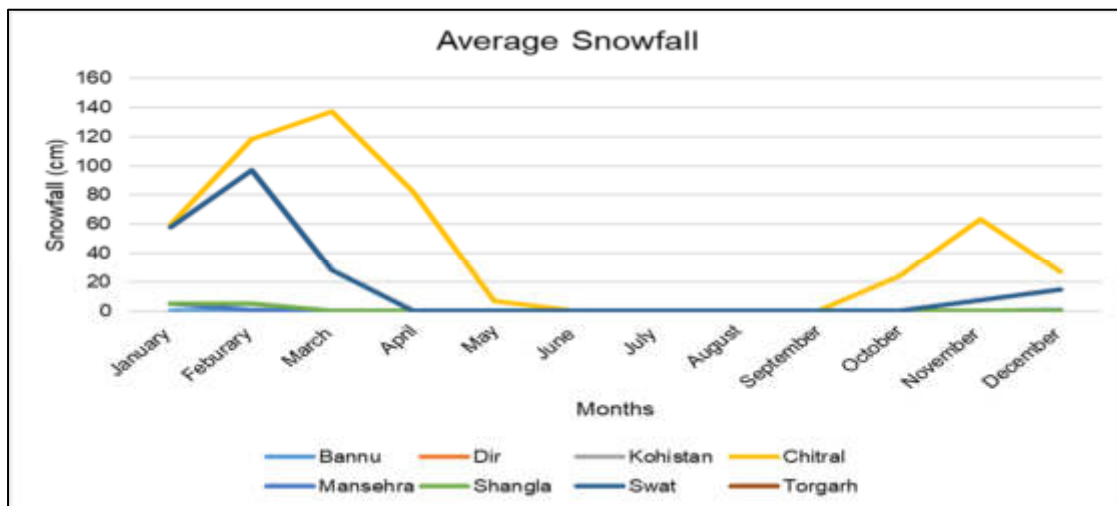


Figure 4-7: Average Snowfall at Project Site

- 119. Central KP including districts like Dir, might receive occasional snowfall in the winter, with an average of 2 to 5 cm during the coldest months. However, districts like Bannu and DI Khan, located in the southern plains, typically experiences little to no snowfall due to its lower altitude and warmer climate.
- 120. Different districts of KP observe different wind speeds. Bannu, Karak, Kohat generally has the highest average wind speed throughout the years, with speeds ranging from 4 to 6 Kmph. Peshawar, Nowshera, Mardan has a moderate average wind speed, ranging from 3 to 5 Kmph. However, Charsadda, Swabi, Dir generally has the lowest average wind speed, ranging from 2 to 4 Kmph.

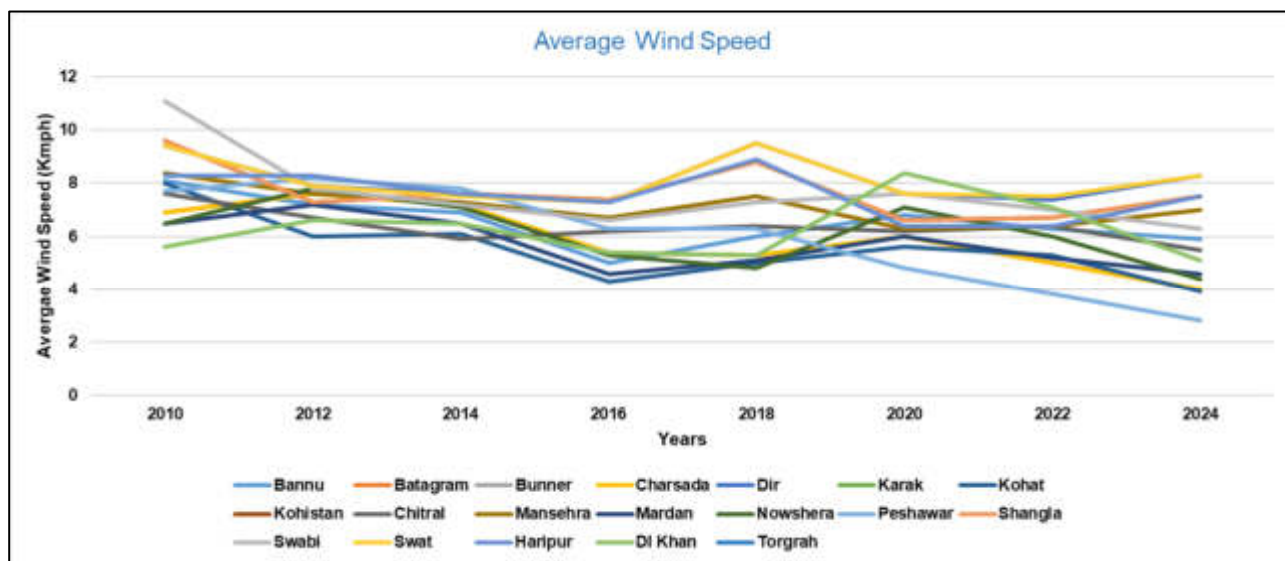
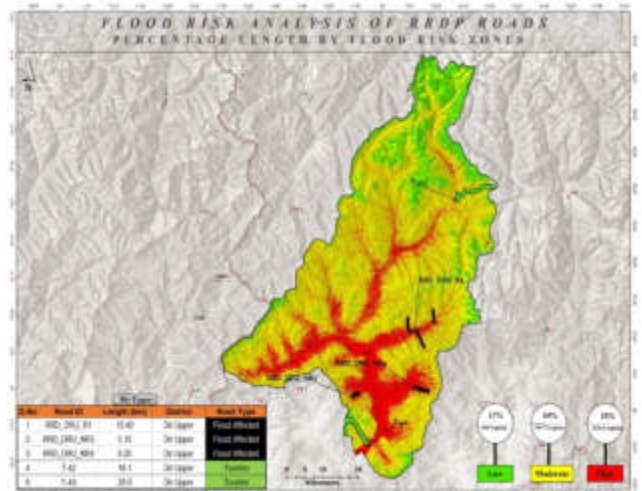
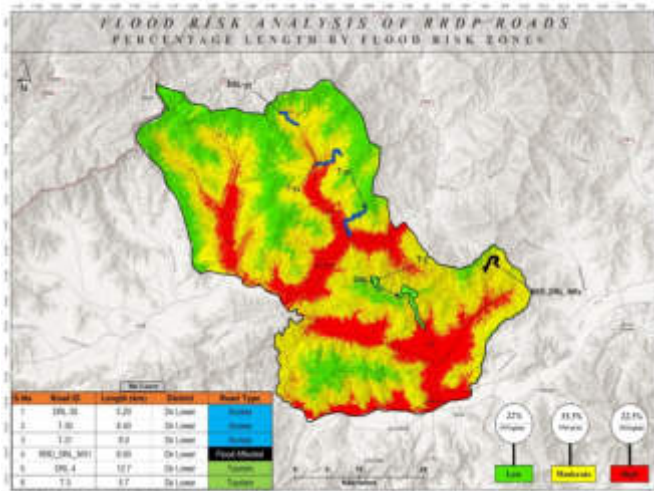
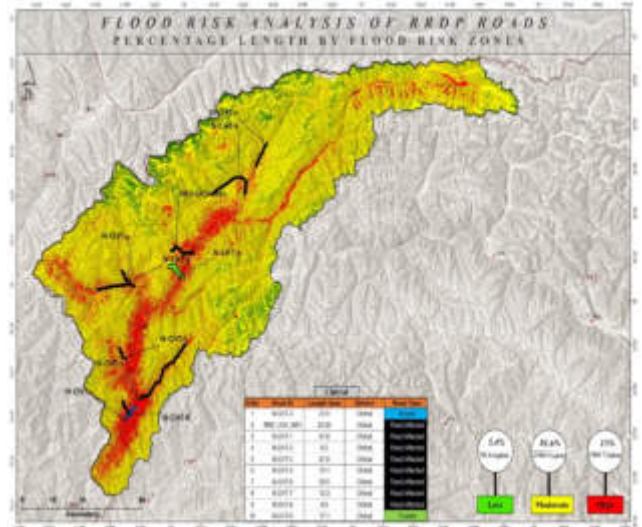
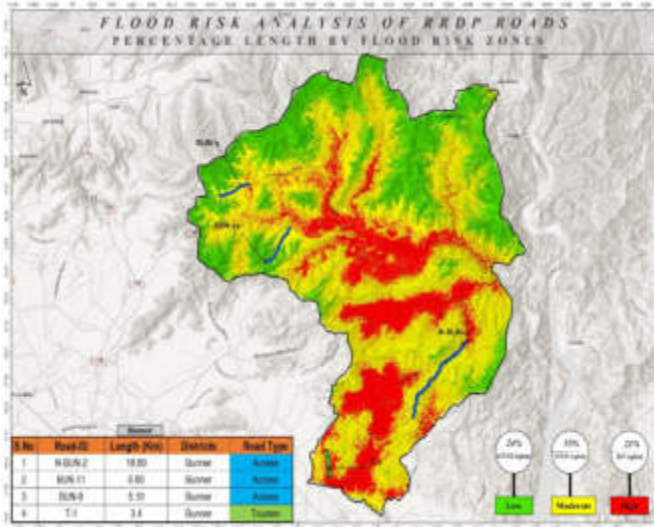


Figure 4-8: Average Wind Speed

- 121. Among the 89 roads and 32 bridges, some roads are prone to climate change such as very high and low temperatures and precipitation such as BUN-2, BUN-11, BUN-9, T-1,

N-CHT-2, RRD-UCH-NR-1, NCHT-1, N-CHT-3, N-CHT-4, N-CHT-5, N-CHT-6, N-CHT-7, N-CHT-8, N-CHT-9, T-31, RRD_DRL_NR1, DRL-4, RRD_DRU_NR3 and RRD_KRK_R1.



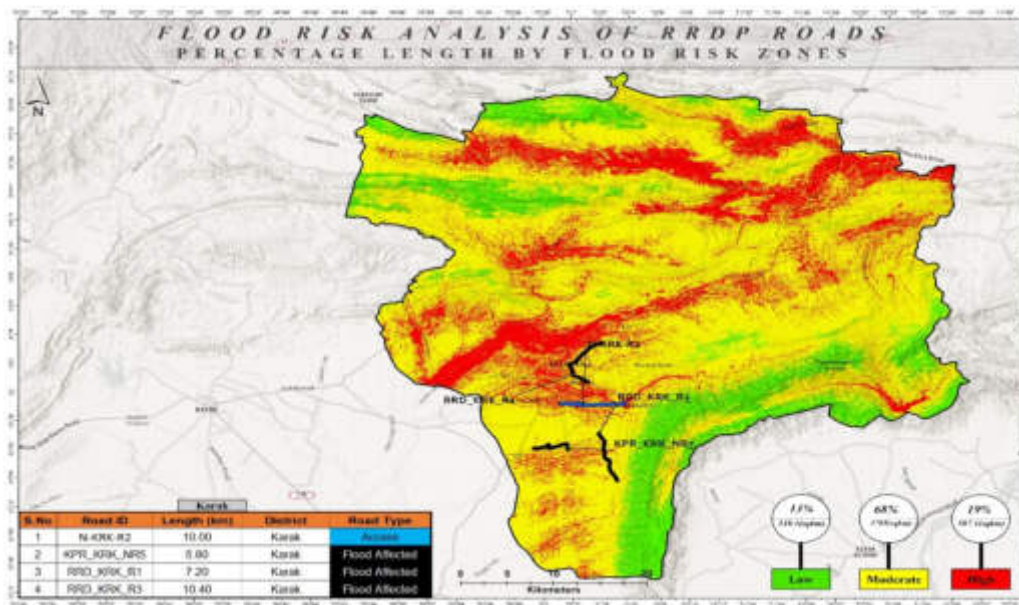


Figure 4-9: Maps of Road with Climate Change Pron Areas

4.2.5 Water Resources

- 122. The proposed project involves the rehabilitation of access roads, tourism roads, bridges, and roads affected by flooding. The restoration of bridges is crucial for enhancing connectivity over water bodies. The bridges and roads located in flood prone areas are located in the vicinity of the prominent water bodies. The Mastuj River, Kalash River, Lutkho River, Arkari Gol Water Channel, Jingeret Water Channel are flowing in the vicinity of the RRD-UCH-NR1 and N-CHT-5 respectively. The Trich Gol Water Channel is passing along the N-CHT-6 and N-CHT-7, District Chitral.
- 123. The Indus River is flowing in the surrounding of KPR-DIK-R13, RRD-DIK-R4, RRD-DIK-NR5, RRD-DIK-NR6, RRD-DIK-NR7, RRD-DIK-NR8, RRD-DIK-NR10, RRD-LKH-R1, RRD-LKH-R2, RRD-LKH-R3, and RRD-LKH-R4.
- 124. The Kurram River is passing along the KPR-KRK-NR5, RRD-KRK, R1 and RRD-KRK-R3, District Karak. The River Swat is flowing in the vicinity of RRD-DRL-NR1. The Pajkora dara is passing along RRD-DRU-NR3, District Dir. The Khamistani Water Channel is flowing along the RRD-DIK-R1 and RRD-DIK-R6, District Dera Ismail Khan.
- 125. However, some of the water bodies are also located around tourism and access roads. The Kunhar Water Channel is passing along a tourism road - Pashty road (N-CHT-9), District Chitral. While Nara Waterfall is located at the end of Noori Waterfall Road (HRI-17), Tabela Lake lies 1359 meters away from HRI-17, District Haripur.

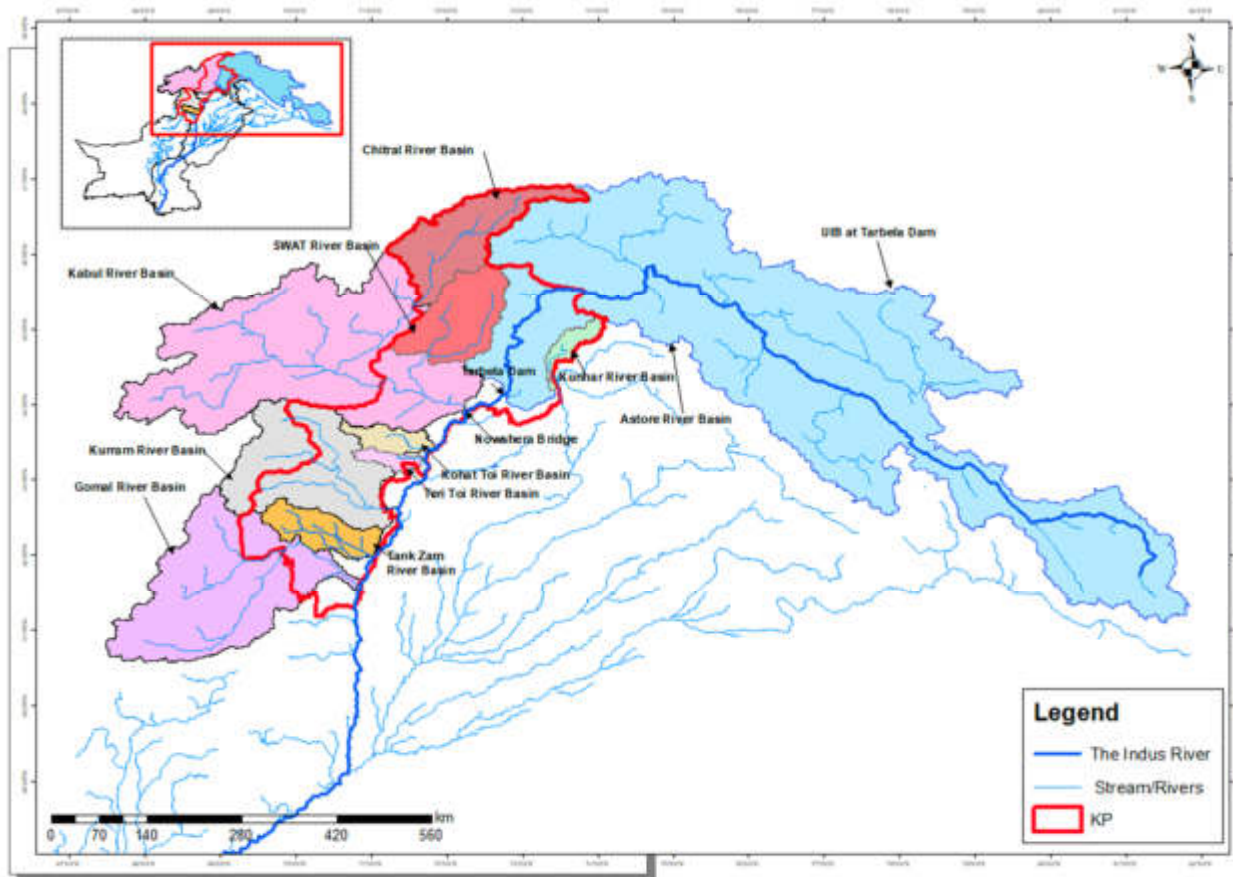


Figure 4-10: Main River Basins of Project area




126. The Kunhar Rivers is flowing in the vicinity of Shringri road (MAN-2), and Sharan Forest Road (T-22), District Mansehra. Lake Saif-ul-Maluk flows along the various RDs of the Saif-ul-Maluk Lake Road (T-12), District Mansehra. Additionally, Swat River and Utrar River Tributary are located near the Kalam Banr Shahoo Road (SWT-5) and Kandol Lake Paristan Lake Road (T-4) respectively in District Swat (figure 4-8).
127. Based on the local hydrology and its catchment areas the table 4-3 describes the catchment characteristics of the main sources of water along the various roads, while table 4-4 describes the details of mean flows and type of nullah along the bridges.

Table 4-3: Catchment characteristics of water sources




Road Name	Road ID	River/Water Channel Name	Mean Flows at peak season
Flood Affected Roads			
Arkari Valley Road	N-CHT-5	Arkari Gol Water Channel	Approximately 10 m ³ /s
Shaghoor to Garam Chahsma Road	N-CHT-4	Lutkho River	Approximately 1.89 m ³ /s
Over road	RRD-UCH-R1	Barum Gol Water Channel Kunar River	Approximately 2.19 m ³ /s
Ramboor Valley Road	N-CHT-3	Kalash River	Approximately 6.91 m ³ /s
Tirch Road	N-CHT-6	Trich Gol River	Approximately 4.15 m ³ /s
Rech Road	N-CHT-7	Trich Gol River	
Jin Jeratkoh Road	N-CHT-8	Jingeret Water Channel Kunar Chitral River	Approximately 14.6 m ³ /s

Road Name	Road ID	River/Water Channel Name	Mean Flows at peak season
Main N-55 Road to Diyal Via Airport road and CRBC colony	KPR-DIK-NR13	Indus River	Approximate 5533 m ³ /s
Indus Highway to Nari Khawar	RRD-KRK, R1	Kurram River	Approximately 24.92 m ³ /s
Shorshing Jakra Baba Road	RRD-DRL-NR1	River Swat	Approximately 28.12 m ³ /s
Katigram to Shagai U/C Kotke	RRD-DRU-NR3	Pajkora dara	Approximately 192.78 m ³ /s
Prova to Chowdwan Road	RRD-DIK-R1	Khamistani Water Channel	Approximately 0.89 m ³ /s
Access/Tourism Roads			
Pashty Road	N-CHT-9	Kunhar Water Channel	Approximately 16.13 m ³ /s
Noori Waterfall Road	HRI-17	Nara Waterfall	Approximately 1.02 m ³ /s




Table 4-4: Details of Mean Flows and Type of Nullah Along the Bridges

Sr. No.	District	IDs	Bridge Name	Nullah/ River Type	High Flow Months	Flow Type	Pictorial Evidences
1	Battagram	BTG-BR-4	Kund Banna	Bandai Allay (Seasonal Nullah)	July, August	Seasonal	
2	Buner	N-BUN-BR-90	Akhoond Sara Bridge	Akhoond Sara Kas Krona (drain), Have residential and sewerage water	Sewerage drain for the whole year	Its Drain water nullah	
3	Buner	BUN-BR-87	Malli-pur Bridge	Lulia Khwar, (Seasonal Nullah)	July, August	Seasonal	

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Sr. No.	District	IDs	Bridge Name	Nullah/ River Type	High Flow Months	Flow Type	Pictorial Evidences
4	Buner	BUN-BR-89	Baba Sori Bampuhba	Bampokha nullah, (Seasonal Nullah having mostly residential effluent)	July, August	Seasonal	
5	Charsadda	CHR-BR-90	Chuti Bridge	Jindi river (low flow water river)	July, August, September	Seasonal	
6	Dir Lower	DRL-BR-54	Shah Kheli Bridge	Konai Khwar (Seasonal Nullah)	July, August	Seasonal	




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Sr. No.	District	IDs	Bridge Name	Nullah/ River Type	High Flow Months	Flow Type	Pictorial Evidences
7	Dir Lower	DRL-BR-61	Shalapalm Bridge	Panjokora River	July, August, September	Perennial	
8	Dir Lower	DRL-BR-62	Bridge v/c Munda	Panjokora River branch (seasonal flow)	July, August, September	Perennial	
9	Dir Upper	DRU-BR-26	Nangari Bridge	Baraul Khwar (Natural drain)	July August	Seasonal	





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Sr. No.	District	IDs	Bridge Name	Nullah/ River Type	High Flow Months	Flow Type	Pictorial Evidences
10	Dir Upper	DRU-BR-53	Malak Abad Bridge	Panjkora River	July, August, September,	Perennial	
11	Karak	KR-BR-112	Latambar Bridge Kasho	Kashu nullah (Seasonal Nullah)	Active during the flood season	Seasonal	
12	Kohat	KOHAT-BR-110	Kharmatoo Road Billitang	Kharmatoo (Natural drain)	Active during the flood season	Seasonal	






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Sr. No.	District	IDs	Bridge Name	Nullah/ River Type	High Flow Months	Flow Type	Pictorial Evidences
13	Kohistan	KOH-BR-24	Goshali Bridge	Sapt Gah (Natural nullah)	July, August, September	Seasonal	
14	Kohistan	KOH-BR-96	Harban Hurail Bridge	Harban Nala (seasonal natural nullah)	July, August, September	Seasonal	
15	Kohistan	KOH-BR-111	Seo Eshal Bridge	Dallo Khwar (seasonal natural nullah)	July, August, September	Seasonal	


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Sr. No.	District	IDs	Bridge Name	Nullah/ River Type	High Flow Months	Flow Type	Pictorial Evidences
16	Lower Chitral	CHT-BR-1	Jeepable bridge at Gorengole	Shishi nullah	June, July, August	Perennial	
17	Mansehra	MAN-BR-11	Siren bridge	Siren nullah	June, July, August, September	Perennial	
18	Mansehra	MAN-BR-27	Malkan Bridge U/C Battal	Malkan Khwar (natural drain)	Active during the flood/ rainy season	Seasonal	


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Sr. No.	District	IDs	Bridge Name	Nullah/ River Type	High Flow Months	Flow Type	Pictorial Evidences
19	Mansehra	MAN-BR-75	Naran-2 Bridge	Saiful Muluk Katha (seasonal natural nullah)	June, July, August, September	Seasonal	
20	Mansehra	MAN-BR-100	Baffa Eidgah Bridge	Baffa Katha (downstream siren bridge)	July, August	Seasonal	
21	Mardan	MRD-BR-69	Pashkando Bridge	Peshkando canal	July, August, September	Seasonal	
22	Mardan	MRD-BR-101	Shah Noor Bridge	Dosara Distributary	July, August, September	Seasonal	


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Sr. No.	District	IDs	Bridge Name	Nullah/ River Type	High Flow Months	Flow Type	Pictorial Evidences
23	Mardan	MRD-BR-102	Chatu Bridge	Chatu nullah	Residential and sewerage water around the year	Seasonal	
24	Mardan	MRD-BR-103	Bridge Over Landay Khwar	Landay Khwar Seasonal nullah	July, August	Seasonal	
25	Noshehra	NOW-BR-105	Banda Sheikh Ismail Bridge	Kabul River irrigation tributary	April, May, September	Perennial	
26	Peshawar	PES-BR-73	Jindi Khwar Bridge	Mera Kachori water Tributaries	Rain/ Flood Water Drain	Seasonal	

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Sr. No.	District	IDs	Bridge Name	Nullah/ River Type	High Flow Months	Flow Type	Pictorial Evidences
27	Shangla	SNG-BR-59	Komalai Bridge	Damorai and Qala water tributaries	Rain/ Flood Water Drain	Seasonal	
28	Shangla	SNG-BR-80	Ganshal Peer Kana	Chundakai Khwar	July, August, September	Perennial	
29	Swabi	SWB-BR-55	Shomlo Derai Bridge	Loe Canal	Complete year	Perennial	
30	Swat	SWT-BR-8	Gula Der Bridge Damage	Marghazar Khwar	July, August, September	Seasonal	


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Sr. No.	District	IDs	Bridge Name	Nullah/ River Type	High Flow Months	Flow Type	Pictorial Evidences
31	Swat	SWT-BR-30	Kula Karin Bridge	Miandam Khwar	July, August, September	Seasonal	
32	Swat	SWT-BR-106	Shaho Kalam Bridge U/C Kalam	Ushu River water tributary	June, July Agust	Seasonal	


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4.2.6 Floods

128. Floods within the basins of KP are typically classified into three main categories: riverine floods, predominantly caused by intense precipitation events during the monsoon season; Glacier Lake Outburst Floods (GLOFs), a common occurrence in the mountainous regions of Northern Pakistan; and Hill Torrents, which occur in the rugged terrain of the Koh-e-Sulaiman range. The National Disaster Management Plan (NDMP) of 2012 provides insights into the most vulnerable districts in Pakistan. According to this plan, out of KP's total 37 districts, 23 are identified as susceptible to riverine and flash floods, including those caused by Hill Torrents. This highlights the significant risk posed by various flood types in the region and underscores the importance of strategic disaster preparedness and mitigation efforts in vulnerable areas.

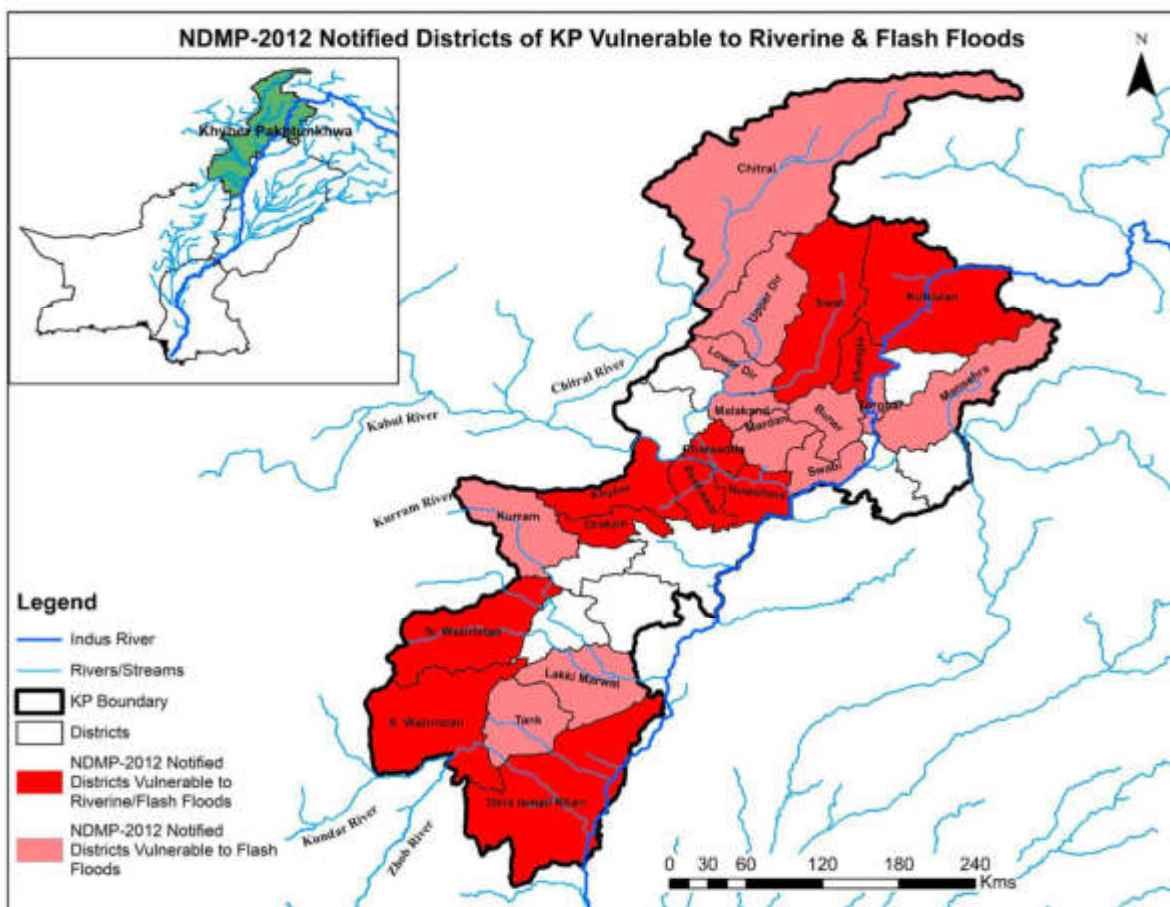


Figure 4-11: NDMP-2012 Notified Districts in KP, Vulnerable to Riverine and Flash Floods

129. Many of the districts identified in the NDMP-2012 were impacted by the floods of 2022. However, the flood-affected districts under the RRDP are primarily situated within five distinct river basins. These include Upper and Lower Dir within the Swat River basin, Upper and Lower Chitral where flood-affected roads are located in the Chitral River basin, Upper and Lower Kohistan within the Upper Indus Basin (UIB), Karak near Kurram in the Kurram River basin, and DI Khan within the Gomal River basin. This delineation provides a detailed overview of the specific geographical areas targeted by the RRDP, focusing on

key regions within the identified river basins that are particularly vulnerable to flood-related hazards and require targeted intervention and infrastructure development.

130. Among the 89 roads and 32 bridges the following roads are present in potentially flooded areas RRD_UCH_NR1, N-CHT-1,N-CHT-5, N-CHT-6,N-CHT-7,KPR_DIK_NR11,KPR_DIK_NR13, RRD_DIK_R1, RRD_DIK_R2, RRD_DIK_R4, RRD_DIK_R6, RRD_DIK_R7, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_R1, RRD_DRU_NR3, RRD_DRU_NR4, KPR_KRK_NR5, RRD_KRK_R1, RRD_KRK_R3.
131. As described earlier, among 32 bridges, 19 bridges will be prefabricated steel while remaining 13 will be the RCC bridges. In 13 RCC bridges only 4 bridges are multispan while 9 bridges are single span bridge which have low. Flood threat in their respective areas.

Table 4-5: List of Roads Present Potentially Flood Areas

#	Road ID and Name	District	Road Length (km)	Flood Threat
1	RRD_UCH_NR1: Rehabilitation of Oveer road in Chitral	Chitral	20.20	Moderate
2	N-CHT-1: Rehabilitation of Shesha to Madalcasht road in Chitral	Chitral	41.6	Moderate
3	N-CHT-5: Rehabilitation of Arkari Valley road in Chitral	Chitral	10.1	Moderate
4	N-CHT-6: Rehabilitation of Tirch road from Nishko bridge to Shahgroom Tirch, Chitral	Chitral	30.0	Low
5	N-CHT-7: Rehabilitation of Rech road in Chitral	Chitral	12.3	Low
6	KPR_DIK_NR11: Rehabilitation of Main N-50 to Shero Kuhna road in D.I. Khan	D.I. Khan	6.80	Low
7	KPR_DIK_NR13: Main N-55 road to Diyal via Airport and CRBC Colony, D.I. Khan	D.I. Khan	6.10	Moderate
8	RRD_DIK_R1: Rehabilitation of Prova to Chowdwan road in D.I.khan	D.I. Khan	29.60	Moderate
9	RRD_DIK_R2: Rehabilitation of Kulachi to Luni road in D.I.khan	D.I. Khan	6.20	Moderate
10	RRD_DIK_R4: Rehabilitation of Mian Kasirai Shareef road (Darazinda) in D.I.khan	D.I. Khan	10.00	Moderate
11	RRD_DIK_R6: Rehabilitation of Parwara jalal Khell road (Darazinda) in D.I.Khan	D.I. Khan	7.30	Low
12	RRD_DIK_R7: Rehabilitation of Main Daraban road to Kot Walidad via Garah Khan	D.I. Khan	8.00	Moderate
13	RRD_DIK_NR4: Rehabilitation of Indus highway to Dhok Rabnawaz and Chah Hussain road in D.I.khan	D.I. Khan	9.10	Low
14	RRD_DIK_NR5: Rehabilitation of Chashma road, Thathal Adda to Phahar pur old Canal road Via Mubarak shah & Thatha in D.I.khan	D.I. Khan	10.40	Moderate
15	RRD_DIK_NR6: Rehabilitation of road from Chashma road to village Musa khar and Jabbar wala in D.I.khan	D.I. Khan	5.10	Moderate
16	RRD_DIK_NR7: Rehabilitation of Awan Nala Civil Minor road in D.I.khan	D.I. Khan	10.50	Low
17	RRD_DIK_NR8: Rehabilitation of road from CRBC Canal to Diyal Paharpur Canal road & Rehmat Abad Link in D.I.khan road from	D.I. Khan	12.60	Low

#	Road ID and Name	District	Road Length (km)	Flood Threat
18	RRD_DIK_NR9: Rehabilitation of Pusha Pul to Garrah Rehman in D.I.khan	D.I. Khan	5.30	Moderate
19	RRD_DIK_NR12: Rehabilitation of Jhandi Sewaag Road in D.I.khan	D.I. Khan	7.50	Low
20	RRD_DIK_NR10: Rehabilitation of Main N-55 road to Sadra Sharif Road in D.I.khan	D.I. Khan	5.00	Moderate
21	RRD_DIK_NR14: Rehabilitation of Giloti Road in D.I.khan	D.I. Khan	68.00	Moderate
22	RRD_DRL_NR1: Rehabilitation of Shorshing Jakra Baba Road	Lower Dir	8.00	Moderate
23	RRD_DRU_R1: Link Roads Usherai Dara	Upper Dir	15.40	Low
24	RRD_DRU_NR3: Rehabilitation of Katigram to Shagai U/C Kotke	Upper Dir	5.10	Moderate
25	RRD_DRU_NR4: Rehabilitation of Sundrai to Qadarkandow Road (Nehag Dara)	Upper Dir	8.20	Moderate
26	KPR_KRK_NR5: Rehabilitation of Hamdan to Inzar More in Karak	Karak	5.80	Moderate
27	RRD_KRK_R1: Rehabilitation of Indus Highway to Nari Khawar in Karak	Karak	7.20	Low
28	RRD_KRK_R3: Rehabilitation of Payala More to Shahidan Banda in Karak	Karak	10.40	Moderate
29	RRD_LKH_R1: Rehabilitation of Batera Road in Lower Kohistan	Lower Kohistan	10.30	Moderate
30	RRD_LKH_R2: Rehabilitation Pattan Ziarat Road (Seer Gazi Abad to Kharat) in Lower Kohistan	Lower Kohistan	10.00	Low
31	RRD_LKH_R1: Rehabilitation of Masham Road in Lower Kohistan	Lower Kohistan	5.10	Low
32	RRD_LKH_R4: Rehabilitation of Chawa Darra Road and Renolia Road Tehsil, Bunkat, Ronolia in Lower Kohistan	Lower Kohistan	13.80	Moderate
33	RRD_UKH_R1: Rehabilitation of Jalkot Goshali Road 1: Gabber Nullah Road in Upper Kohistan	Upper Kohistan	14.40	Moderate

Land use

132. The land use of the KP is comparatively less productive as compared to the Punjab province of Pakistan. The central and northern part is more fertile as compared to the south part which is comparatively less productive. In general, central and north area of the KP is more cultivable with 1,585,590 hectares of land while south region has 13,890 hectares of cultivable land.

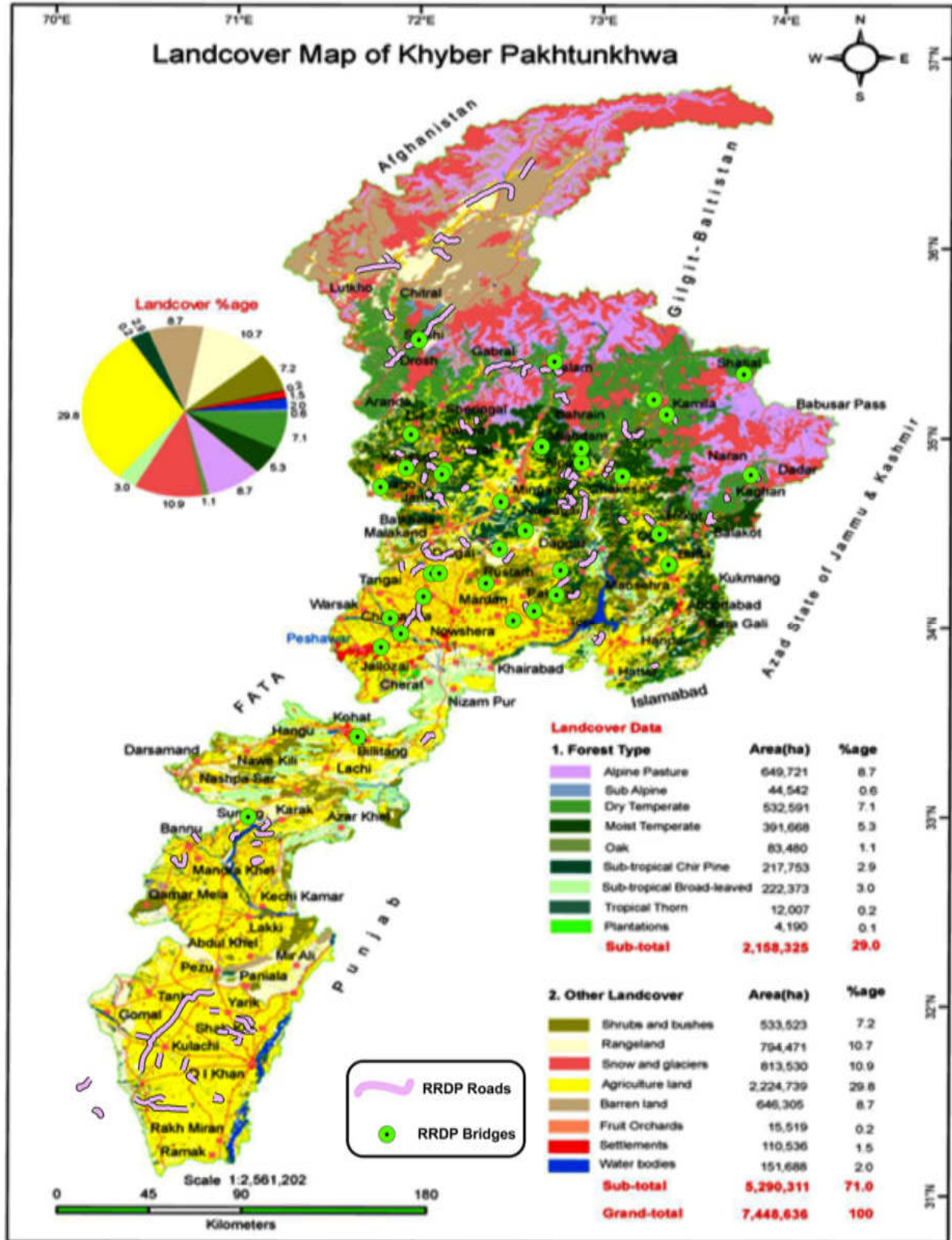


Figure 4-12: Land use map of the KP

4.2.7 Environmental Monitoring Data

133. As part of the IEE baseline instrumental monitoring was planned for collection of field data regarding environmental parameters for air, water, noise, etc. An environmental laboratory; accredited with the KP Environment Protection Agency, was engaged for this purpose. The monitoring locations were selected keeping in view the nearest residential dwellings, construction transportation route, downstream wind directions and availability of any sensitive receptors (mosque, school, medical facility, residential houses) at the monitored sites.

Table 4-6: Environmental Monitoring Parameters

Environmental Aspect	Parameters Monitored
Ambient Air Quality	PM ₁₀ , CO, NO, NO ₂ , SO ₂ etc. for 24hrs basis
Ambient Noise Levels	Noise levels for 24hrs basis as per NEQS/WHO standards
Water Quality	Parameters covering physical, chemical and biological properties as per NEQS/WHO standards

134. The monitored results were compared with NEQS and WHO standards. The analysis results are discussed in the following sections.

4.3 Monitoring Outcomes

4.3.1 Air and Noise Monitoring

135. Ambient air quality and noise levels were continuously monitored for 24hours at selected locations (table 4.2).

136. As discussed above the monitoring locations were selected keeping in view the nearest residential dwellings, construction transportation route, downstream wind directions and availability of any sensitive receptors (mosque, school, medical facility, residential houses) at the monitored sites. The monitored data for ambient air including PM₁₀, CO, NO_x, SO₂ and for noise levels indicate that concentrations of these pollutants are in compliance with the national environmental standards as well as the WHO air guidelines for PM₁₀ and other gases at all monitored locations, similar the noise levels indicate that monitored values are in compliance with the day and night standards of NEQS and WHO.

137. The outcomes of the results are given in the annexure-2.



Table 4-7: Ambient Air and Noise Results from Monitored Locations

Road IDs	Monitoring RDs (km)/ Locations	24 Hours Average Concentration of Pollutants										
		PM ₁₀	PM _{2.5}	CO	NO ₂	SO ₂	Noise Day Time Average (Leq)	Noise Night Time Average (Leq)				
		(µg/m ³)	(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)	(Leq)	(Leq)	dB(A)			
BN-3	km 0+025	37.91	17.91	0.3	4.57	4.96	47.82	39.69				
BN-5	km 0+030	41.54	11.54	0.32	5.06	5.31	45.87	33.83				
N-BN-1	km 0+030	39.67	19.67	0.27	4.83	5.27	42.46	31.97				
N-BN-11	km 1+340	32.82	12.82	0.16	3.91	4.54	49.95	37.40				
BTG-16	km 03+550	34.94	14.94	0.11	1.71	2.8	40.08	29.11				
BTG-2	km 02+150	38.57	18.57	0.13	2.2	3.15	41.42	33.57				
BTG-BR-4	km 0+025	36.7	16.7	0.08	1.97	3.11	50.76	41.66				
N-BUN-2	km 02+850	33.18	13.18	0.14	2.21	2.07	47.23	38.19				
BUN-11	km 01+670	36.81	16.81	0.16	2.63	2.38	48.81	35.80				
BUN-9	km 03+150	34.94	14.94	0.11	2.75	2.23	45.4	33.94				
T-1	km 01+525	35.04	25.04	0.26	4.33	4.72	52.89	39.37				
N-BUN-BR-90	km 0+035	38.67	28.67	0.28	4.82	5.07	43.02	31.08				
BUN-BR-87	km 0+15	41.56	21.56	0.29	4.87	4.8	45.4	33.94				
BUN-BR-89	km 0+25	37.92	27.92	0.29	5.97	5.72	46.78	38.64				
CHR-9	km 02+750	35.97	25.97	0.26	3.09	3.51	51.78	42.27				
CHR-10	km 03+510	37.23	27.23	0.29	3.14	3.6	49.83	36.41				
N-CHT-2	km 01+150	36.05	26.05	0.18	2.45	2.31	46.42	34.55				
N-CHT-9	km 01+550	39.68	29.68	0.2	2.87	2.62	51.91	39.98				
RRD_UCH_NR1	km 03+550	37.81	27.81	0.15	2.99	2.47	44.04	31.69				
N-CHT-1	km 04+130	37.91	27.91	0.3	4.57	4.96	45.38	36.15				
N-CHT-1	km 03+550	41.54	21.54	0.32	5.06	5.31	52.32	43.07				
N-CHT-5	km 04+850	40.1	20.1	0.25	3.85	4.47	50.74	41.22				
N-CHT-5	km 03+955	42.67	22.67	0.29	4.88	4.83	46.78	38.64				
N-CHT-6	km 01+250	44.43	24.43	0.33	5.11	5.04	51.78	42.27				
N-CHT-7	km 03+930	40.79	20.79	0.33	6.21	5.96	49.83	36.41				
N-CHT-8	km 01+560	44.42	27.91	0.35	6.7	6.31	46.42	34.55				
CHT-BR-1	km 0+15	42.55	21.54	0.3	6.47	6.27	51.91	39.98				
KPR_DIK_NR11	km 04+190	42.72	29.67	0.28	3.97	4.13	46.78	38.64				
KPR_DIK_NR13	km 03+850	46.35	22.82	0.3	4.46	4.48	51.78	42.27				
RRD_DIK_R1	km 03+665	44.48	24.94	0.25	4.23	4.44	49.83	36.41				
RRD_DIK_R2	km 04+125	37.63	28.57	0.14	3.31	3.71	46.42	34.55				
RRD_DIK_R4	km 05+150	40.51	26.7	0.2	3.64	4.06	51.91	39.98				

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Road IDs	Monitoring RDs (km)/ Locations	24 Hours Average Concentration of Pollutants							
		PM ₁₀	PM _{2.5}	CO	NO ₂	SO ₂	Noise Day Time Average (Leq)	Noise Night Time Average (Leq)	
		(µg/m ³)	(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)	(Leq)	(Leq)	
RRD_DIK_R6	km 04+325	42.97	23.18	0.29	4.09	4.23	46.78	38.64	
RRD_DIK_R7	km 03+750	45.54	26.81	0.23	3.55	4.59	51.78	42.27	
RRD_DIK_NR4	km 03+150	47.3	24.94	0.25	3.78	4.8	49.83	36.41	
RRD_DIK_NR5	km 06+550	43.66	25.04	0.22	4.88	4.72	46.42	34.55	
RRD_DIK_NR6	km 02+550	47.29	28.67	0.28	3.77	4.06	51.91	39.98	
RRD_DIK_NR7	km 04+950	45.42	27.23	0.24	2.14	3.58	44.04	31.69	
RRD_DIK_NR8	km 06+150	38.57	29.81	0.25	3.28	4.3	45.38	36.15	
RRD_DIK_NR9	km 02+850	41.45	11.56	0.29	3.64	4.65	52.32	43.07	
RRD_DIK_NR12	km 03+250	43.91	17.91	0.21	3.72	4.89	50.74	41.22	
RRD_DIK_NR10	km 03+125	46.48	11.54	0.26	2.09	2.18	46.78	38.64	
RRD_DIK_NR14	km 14+950	48.24	19.67	0.19	3.26	3.39	51.78	42.27	
DRL-35	km 03+550	25.8	12.82	0.12	1.92	1.69	49.83	36.41	
T-30	km 04+550	29.43	24.94	0.08	2.34	1.31			
T-31	km 03+950	27.56	28.57	0.03	2.46	1.16	46.78	38.64	
DRL-4	km 01+250	27.66	26.71	0.18	2.62	1.65	51.78	42.27	
T-3	km 01+950	31.29	23.18	0.2	3.11	2	49.83	36.41	
RRD_DRL_NR_1	km 02+250	29.85	26.81	0.13	1.9	1.16	46.42	34.55	
DRL-BR-54	km 0+10	32.42	24.94	0.17	2.93	1.52	51.91	39.98	
DRL-BR-61	km 0+15	34.18	25.04	0.21	3.16	1.73	44.04	31.69	
DRL-BR-62	km 0+20	30.54	28.67	0.21	2.87	2.05	45.38	36.15	
T-42	km 09+350	34.17	27.23	0.23	3.36	2.4	52.32	43.07	
T-43	km 13+150	32.3	29.8	0.18	3.13	2.36	50.74	41.22	
RRD-DRU-R1	km 02+750	25.45	11.56	0.09	2.21	1.63	46.78	38.64	
RRD-DRUNR3	km 03+450	28.33	27.92	0.13	2.54	1.98	46.78	38.64	
RRD-DRU-NR4	km 01+450	30.79	25.97	0.22	2.99	2.15	51.78	42.27	
DRU-BR-26	km 0+10	33.36	27.23	0.26	4.02	2.51	49.83	36.41	
DRU-BR-53	km 0+10	35.12	26.05	0.3	4.25	2.72	46.42	34.55	
T-35	km 02+550	35.79	29.68	0.18	2.09	2.33	51.91	39.98	
T-7	km 03+550	41.64	27.81	0.2	2.45	2.71	44.04	31.69	
N-KRK-R2	km 01+250	34.62	27.91	0.24	3.09	3.61	45.38	36.15	
KPR-KRK-NR5	km 01+150	38.25	21.54	0.22	3.27	3.97	52.32	43.07	
RRD-KRK-R1	km 02+610	36.38	20.11	0.18	3.99	3.54	50.74	41.22	
RRD-KRK-R3	km 01+550	29.53	22.67	0.1	3.07	3.19	46.78	38.64	
Kohat-3	km 02+850	36.05	27.91	0.18	2.45	2.31	51.78	42.27	

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		PM ₁₀	PM _{2.5}	CO	NO ₂	SO ₂	Noise Day Time Average (Leq)	Noise Night Time Average (Leq)	
		(µg/m ³)	(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)	(Leq)	dB(A)	
N-Kohat-3	km 03+210	39.68	21.54	0.2	2.87	2.62	49.83	36.41	
Kohat-BR-110	km 0+10	37.81	29.67	0.15	2.99	2.47	46.42	34.55	
RRD-LKH-R1	km 02+350	36.23	22.82	0.13	2.06	3.28	51.91	39.98	
RRD-LKH-R2	km 01+350	39.86	24.94	0.15	2.55	3.63	44.04	31.69	
RRD-LKH-R-1	km 01+750	37.99	28.57	0.1	2.32	3.59	45.38	36.15	
RRD-LKH-R4	km 02+850	31.14	26.7	0.14	1.4	2.86	52.32	43.07	
RRD-UKH-R1	km 04+150	29.46	23.18	0.16	1.08	1.18	50.74	41.22	
KOH-BR-24	km 0+25	34.37	36.81	0.12	1.12	0.63	46.78	38.64	
KOH-BR-96	km 0+10	38	24.94	0.09	0.86	0.94	51.78	42.27	
KOH-BR-111	km 0+10	36.13	25.04	0.14	0.93	0.79	49.83	36.41	
CHR-4	km 0+550	32.83	28.67	0.17	5.31	5.3	46.42	34.55	
MLK-7	km 01+950	35.71	27.23	0.21	5.64	5.65	51.91	39.98	
MLK-4	km 02+250	38.17	29.8	0.3	6.09	5.82	44.04	31.69	
N-MLK-1	km 08+250	40.74	21.56	0.34	7.12	6.18	45.38	36.15	
N-MLK-2	km 02+550	42.5	27.92	0.38	7.35	6.39	52.32	43.07	
MAN-2	km 02+750	38.92	27.91	0.22	2.69	2.07	50.74	41.22	
T-12	km 01+850	42.55	21.54	0.24	3.11	2.38	46.78	38.64	
T-22	km 02+550	40.68	29.67	0.19	3.23	2.23	51.78	42.27	
MAN-BR-11	km 0+10	40.78	22.82	0.34	4.81	4.72	49.83	36.41	
MAN-BR-100	km 0+15	44.41	24.94	0.36	5.3	5.07	46.42	34.55	
MRD-BR-69	km 0+025	37.93	28.57	0.32	4.09	4.54	51.91	39.98	
MRD-BR-101	km 0+20	42.84	26.71	0.36	5.14	3.99	44.04	31.69	
MRD-BR-102	km 0+10	46.47	23.18	0.38	5.56	4.3	45.38	36.15	
MRD-BR-103	km 0+10	44.6	26.81	0.33	5.68	4.15	52.32	43.07	
NOW-BR-105	km 0+10	42.81	24.94	0.58	6.49	5.77	50.74	41.22	
PES-BR-73	km 0+10	39.58	25.04	0.42	5.79	4.92	46.78	38.64	
SNG-14	km 01+550	23.76	28.67	0.15	1.96	1.81	51.78	42.27	
SNG-61	km 03+80	27.39	27.23	0.17	2.38	2.12	49.83	36.41	
SNG-20	km 04+150	25.52	29.84	0.12	2.5	1.97	46.42	34.55	
SNG-26	km 01+125	25.62	21.56	0.27	2.08	2.74	46.78	38.64	
SNG-28	km 02+650	29.25	17.92	0.29	2.57	3.09	51.78	42.27	
SNG-30	km 03+250	27.81	15.97	0.22	1.36	2.25	49.83	36.41	
SNG-27	km 03+590	30.38	17.23	0.26	2.39	2.61	46.42	34.55	
SNG-29	km 03+510	32.14	16.05	0.3	2.62	2.82	51.91	39.98	

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		PM ₁₀	PM _{2.5}	CO	NO ₂	SO ₂	Noise Day Time Average (Leq)	Noise Night Time Average (Leq)
		(µg/m ³)	(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)	(Leq)	dB(A)
SNG-63	km 04+580	28.5	19.68	0.3	3.72	3.74	44.04	31.69
SNG-22	km 01+950	32.13	17.81	0.32	4.21	4.09	45.38	36.15
SNG-7	km 08+650	30.26	17.91	0.27	3.98	4.05	52.32	43.07
SNG-60	km 07+550	23.41	11.54	0.18	3.06	3.32	50.74	41.22
SNG-33	km 02+150	26.29	17.91	0.22	3.39	3.67	46.78	38.64
SNG-BR-59	km 0+15	28.75	11.54	0.31	3.84	3.84	51.78	42.27
T-2	km 02+850	39.68	19.67	0.16	2.42	2.31	49.83	36.41
SWT-6	km 01+880	30.49	12.82	0.19	2.09	1.98	46.42	34.55
T-19	km 01+150	34.12	14.94	0.21	2.51	2.29	51.91	39.98
T-4	km 02+650	32.25	18.57	0.16	2.63	2.14	44.04	31.69
N-SWT-T2	km 02+550	32.35	16.73	0.31	4.21	4.63	45.38	36.15
N-SWT-T4	km 06+550	35.98	13.18	0.33	4.7	4.98	52.32	43.07
N-SWT-T3	km 03+250	34.54	16.81	0.26	3.49	4.14	50.74	41.22
SWT-BR-8	km 0+10	37.11	14.94	0.3	4.52	4.5	46.78	38.64
NEQSAA		150 (24 hr)	35 (24 hr)	05 (24 hr)	80 (24 hr)	120 (24 hr)	Day Time 55 Night Time 45	
WHO		45 (24 hr)	15 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)	70	


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Monitoring at RRD_DIK_R1



Monitoring RRD_DIK_NR5



Monitoring at RRD_DIK_NR5



Monitoring at N-KRK-R2



Monitoring at km 04+650 CHR-4



Monitoring at N-Kohat-3



Monitoring at BUN-11



Monitoring at BTG-BR-4



Monitoring at N-CHT-1



Monitoring at N-CHT-3



Monitoring at T-12



Monitoring at SNG-61



Monitoring at SNG-63



Monitoring at MLK-4

Figure 4-13: Baseline Environmental Sampling







Figure 4-14: RRDP Environmental Monitoring

4.3.2 Drinking Water and Effluent Quality

138. The water quality was assessed by collecting twenty-one water samples from different locations as discussed above. The analysis results from drinking water samples indicate that all the physical, chemical and biological parameters are in compliance with the national and international standard values.

4.3.3 Sensitive Receptors

139. The sensitive receptors along the roads and bridges are listed with the coordinates in the Table 4.3 below.

Table 4-8: Water Quality Analysis Results

Parameters	Units	WHO	NDWQS	Results									
				T-35	T-7	BN-3	BN-5	N-CHT-3	N-CHT-4	T-31	DRL-4	DRU-BR-26	
pH	--	6.5-8.5	6.5-8.5	7.2	7.28	7.6	7.81	7.4	7.2	7.51	7.2	7.08	
Temperature	°C	----	----	13	13	11	13	13	13	10	9	8	
Taste & Odor	--	Non-Objectable ≤ 15	Non-Objectable	Non-Objectable	Non-Objectable	Non-Objectable	Non-Objectable	Non-Objectable	Non-Objectable	Non-Objectable	Non-Objectable	Non-Objectable	
Color	TCU	≤ 15	<15	4	2	3	5	5	4	6	7	1	
Turbidity	NTU	<5	<5	4.3	1.9	4.2	3.9	2.6	4.3	2.3	2.4	0.4	
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	328	309	326	378	334	328	351	330	333	
Hardness as CaCO ₃	mg/L	-----	<500	214	205	268	262	237	214	349	336	334	
Nitrate (NO ₃)	mg/L	50	≤50	2.48	1.39	0.9	1.2	1.84	2.48	0.39	0.41	0.21	
Nitrite (NO ₂)	mg/L	3	≤3	0.16	0.2	0.006	0.03	0.37	0.16	0.029	0.003	0.38	
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.	0	0.006	N.D.	N.D.	N.D.	N.D.	N.D.	
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Chloride (Cl)	mg/L	250	<250	148	159	79	72	124	148	154	147	164	
Chlorine	mg/L	0.5-1.5	0.5-1.5	0.49	0.44	0.4	0.31	0.56	0.49	0.51	0.77	0.54	
Lead (Pb)	mg/L	0.01	≤0.05	0.0029	0.0024	0.001	0.008	0.029	0.0029	0.007	0.001	0.029	
Fluoride	mg/L	1.5	≤1.5	0.24	0.19	0.58	0.47	0.29	0.24	0.19	0.28	0.03	
Aluminum	mg/L	≤0.2	≤0.2	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Barium (Ba)	mg/L	0.3	0.7	0.19	0.15	0.057	0.19	0.2	0.19	0.28	0.14	0.33	
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Copper (Cu)	mg/L	2	2	0.2	0.16	0.05	0.18	0.16	0.2	0.182	0.022	0.13	
Zinc (Zn)	mg/L	3	5	0.85	0.73	1.09	1.2	0.82	0.85	0.62	0.49	1.03	
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0	0	0	0	0	0	0	0	
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0	0	0	0	0	0	0	0	

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ROAD ID	T-35	T-7	BN-3	BN-5	N-CHT-3	N-CHT-4	T-31	DRL-4	DRU-BR-26
Source	Hand pump	Ground water	Ground water	Ground water	Ground water	Pipe water	Hand pump	Pipe water	Pipe water

Water Quality Analysis Results

Parameters	Units	WHO	NDWQS	Results								
				SWT-6	T-19	SNG-63	SNG-22	NOW-BR-105	MAN-2	T-12	CHR-4	MLK-7
pH	--	6.5-8.5	6.5-8.5	7.37	7.17	7.01	7.22	7.8	7.4	7.2	7.2	7.16
Temperature	°C	----	----	11	13	12	12	16	13	13	13	12
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Objectionable	Objectionable	Objectionable	Objectionable	Objectionable	Objectionable	Objectionable	Objectionable	Objectionable
Color	TCU	≤15	<15	3	5	4	2	5	7	8	5	4
Turbidity	NTU	<5	<5	1.9	3.2	2.2	1.9	4.4	4.6	4.4	2.8	3.1
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	328	339	323	346	350	420	411	317	331
Total Hardness as CaCO ₃	mg/L	-----	<500	318	331	350	344	213	290	340	278	289
Nitrate (NO ₃)	mg/L	50	≤50	0.29	0.57	0.3	0.12	0.98	1.33	1.21	0.84	1.1
Nitrite (NO ₂)	mg/L	3	≤3	0.07	0.006	0.004	0.028	0.016	0.07	0.08	0.016	0.028
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	114.5	127	155	148	93	85	92	124	131
Chlorine	mg/L		0.5-1.5	0.52	0.51	0.57	0.48	0.42	0.55	0.2	0.52	0.56
Lead (Pb)	mg/L	0.01	≤0.05	0.007	0.001	0	0.007	0.002	0.006	0.007	0.002	0.004
Fluoride	mg/L	1.5	≤1.5	0.7	0.46	0.36	0.25	0.62	0.57	0.69	0.25	0.29
Aluminum	mg/L	≤0.2	≤0.2	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.26	0.18	0.17	0.29	0.2	0.42	0.37	0.15	0.14
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.041	0.061	0.054	0.184	0.07	0.25	0.09	0.021	0.028
Zinc (Zn)	mg/L	3	5	0.56	0.81	0.61	0.72	1.11	1.12	1.12	0.76	0.82
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

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Parameters	Units	WHO	NDWQS	Results									
				SWT-6	T-19	SNG-63	SNG-22	NOW-BR-105	MAN-2	T-12	CHR-4	MLK-7	
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0	0	0	0	0	0	0	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0	0	0	0	0	0	0	0	0

Road ID	SWT-6	T-19	SNG-63	SNG-22	NOW-BR-105	MAN-2	T-12	CHR-4	MLK-7
Source	Pipe water	Ground water	Pipe water	Pipe water	Ground water	Pipe water	Hand pump	Pipe water	Pipe water


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Table 4-9: Sensitive Receptors along the Roads

Road ID	Road Name	Type of Receptors	Distance for RoW m	Google Coordinates Longitude	Type of Receptors Latitude
SNG-7	Martung Chakisar Road	Martung Homeopathic Clinic	900	34°40'48.71"N	72°44'49.21"E
		Dhairai Masjid	313	34°41'11.97"N	72°45'27.87"E
		Sarpata Masjid	308	34°42'2.48"N	72°45'27.00"E
		GMS Karindara-School	412	34°42'16.44"N	72°45'32.30"E
		Shangla Chakisar - College	304	34°47'17.93"N	72°46'14.95"E
		GPS Manga-School	334	34°45'3.73"N	72°45'59.23"E
		Masjid Bilo Chakisar	2350	34°45'34.18"N	72°45'49.83"E
		Indus River	3323	34°41'21.07"N	72°47'42.31"E
		Martung Homeopathic Clinic	900	34°40'48.71"N	72°44'49.21"E
		Dhairai Masjid	313	34°41'11.97"N	72°45'27.87"E
SNG-14	Chakesar Nebi More to Said Abad	Shangla chakisar - College	566	34°47'17.72"N	72°46'15.31"E
		Degree College Chakisar	405	34°47'24.74"N	72°46'20.44"E
		Saidabad Public School - School	308	34°48'58.46"N	72°44'46.80"E
		Shangla chakisar - College	566	34°47'17.72"N	72°46'15.31"E
		Basic Health Unit Towa	321	34°47'42.56"N	72°40'57.24"E
		Jamia Masjid Una	205	34°47'4.83"N	72°41'19.18"E
SNG-20	Towa Chowkai Asharkot Road	Maka Masjid	250	34°46'55.17"N	72°41'28.73"E
		GPS Asharkot - Elementary school	220	34°46'7.36"N	72°42'18.74"E
		BaraAwari Mosque	251	34°45'20.24"N	72°41'17.27"E
		GHSS Sundovi Puran - School	300	34°45'57.31"N	72°39'58.85"E
SNG-22	Chagam Alamay Road	Govt Girls High School Sanila	573	34°46'11.74"N	72°39'54.94"E
		GPS Chagam - School	320	34°45'58.17"N	72°39'42.77"E
		Basic Health Unit Chagam	350	34°45'52.39"N	72°39'26.72"E
		Jamia Masjid Matta	475	34°46'19.43"N	72°38'19.84"E
		Masjid Buniirwal Aloch	381	34°44'6.88"N	72°39'51.80"E
SNG-26	Aluch Buniirwall Road	Clinix Pharmacy, Aloch	801	34°44'14.95"N	72°41'12.19"E
		GMS Nimkaly Aloch (Government school)	787	34°44'6.00"N	72°41'14.15"E
		GPS Mandara - School	218	34°46'2.98"N	72°38'8.17"E
		Basic Health Unit Chagam	223	34°45'52.22"N	72°39'26.79"E
SNG-27	Main Dara Road	GPS Chagam - School	337	34°45'58.09"N	72°39'42.81"E
		Jama Masjid Gat Ashary	240	34°46'8.42"N	72°38'12.00"E
		Jamia Masjid Atta	355	34°46'18.96"N	72°38'20.00"E
		GPS Mandara - School	218	34°46'2.98"N	72°38'8.17"E

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Road ID	Road Name	Type of Receptors	Distance for RoW	Google Coordinates		Type of Receptors
				Longitude	Latitude	
SNG-28	Bengalai Landai Balo Chawak Road	Shifa Medical Complex Puran (SMC)	338	34°44'58.09"N	72°40'51.45"E	
		Bara Awari Mosque	378	34°45'20.23"N	72°41'17.21"E	
		GMS Baloo Bingalal Puran	326	34°45'49.03"N	72°42'21.70"E	
		Gps Landai Bingalal - School	303	34°45'27.00"N	72°42'20.68"E	
		Govt. Degree College Puran Lowarbat	788	34°45'21.00"N	72°40'38.00"E	
		Shifa Medical Complex Puran (SMC)	338	34°44'58.09"N	72°40'51.45"E	
SNG-29	Chagum Gumbat Road	Bara Awari Mosque	378	34°45'20.23"N	72°41'17.21"E	
		GMS Baloo Bingalal Puran	326	34°45'49.03"N	72°42'21.70"E	
		Gps Landai Bingalal - School	303	34°45'27.00"N	72°42'20.68"E	
		GPS Chagum - School	321	34°45'58.12"N	72°39'42.93"E	
		Basic Health Unit Chagum	310	34°45'52.33"N	72°39'26.78"E	
		GPS Asharkot	377	34°46'17.34"N	72°42'18.83"E	
SNG-30	Dherai Faiza Sondvi Road	GGMS Makra Puran - School	303	34°46'21.33"N	72°41'48.51"E	
		Government Primary School Makra Puran - School	305	34°46'12.64"N	72°41'43.64"E	
		Jamia Masjid Puran	320	34°46'18.74"N	72°40'57.12"E	
		GPS Velanay - School	674	34°46'31.78"N	72°40'31.83"E	
		GGPS Kiwa Faiza - Elementary school	330	34°46'49.35"N	72°41'0.62"E	
		Badagi Jumat	301	34°47'29.17"N	72°40'47.88"E	
SNG-33	Zara Road	Bilal Masjid Chornawoo	354	34°52'4.49"N	72°42'19.81"E	
		GPS Dondu Zara - School center	301	34°52'1.49"N	72°42'25.96"E	
		Abu Zar Ghaffari Masjid Bela, Zara	332	34°51'27.52"N	72°41'39.47"E	
		Bilal Masjid Chornawoo	354	34°52'4.49"N	72°42'19.81"E	
		GPS Seen Basi - School	445	34°55'1.05"N	72°40'24.73"E	
		Masjid Kuz Brabro Basi	338	34°55'11.62"N	72°40'30.40"E	
SNG-60	Rahimabad Kas Basi Road	Masjid Bar Brabro Basi	679	34°55'11.44"N	72°40'43.71"E	
		GPS Kass Basi - School	350	34°55'23.04"N	72°40'22.35"E	
		GPS Bassi-School	300	34°54'46.91"N	72°39'59.93"E	
		Masjid Bar Baru	329	34°54'53.01"N	72°39'49.66"	
		GPS Piza Bassi-School	340	34°55'54.84"N	72°40'56.86"E	
		GPS Seen Basi - School	445	34°55'1.05"N	72°40'24.73"E	
SNG-61	Miankalay Pagorai Kas Road	Government Middle School Mian Kalay	320	34°54'16.93"N	72°41'32.76"E	
		Bilal Masjid Pagora	440	34°53'57.48"N	72°42'38.89"E	
		Government Middle School Mian Kalay	320	34°54'16.93"N	72°41'32.76"E	
		Bilal Masjid Pagora	440	34°53'57.48"N	72°42'38.89"E	
SNG-63	Alpurai Barkas Kag Road	Gps Kag Basi Alpurai Shangla	300	34°55'12.85"N	72°39'25.85"E	
		Masjid Kandon	350	34°54'48.30"N	72°39'13.77"E	

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Road ID	Road Name	Type of Receptors	Distance for RoW m	Google Coordinates		Type of Receptors
				Longitude	Latitude	
Swat						
N-SWT-T3	Desan Meadows to Kalam Road	GPS Kass Basi	1429	34°55'23.22"N	72°40'22.78"E	
		Masjid Basi Chaland	774	34°55'39.92"N	72°40'15.71"E	
		Gps Kag Basi Apurai Shangla	300	34°55'12.85"N	72°39'25.85"E	
N-SWT-T4	Utror to Thal via Badogi Top Road	Bacha Khan Masjid Jalbanr Road	400	35°27'56.29"N	72°34'50.09"E	
		Government Boys' Primary School, Jāl Banrh	512	35°27'54.78"N	72°34'54.63"E	
		Bacha Khan Masjid Jalbanr Road	400	35°27'56.29"N	72°34'50.09"E	
SWT-5	Kalam Banr Shahoo Road	Government Boys' Primary School, Jāmra	336	35°30'15.68"N	72°25'42.84"E	
		Ayasha Sadiqa Mosque Gal Utror	668	35°29'55.93"N	72°26'22.17"E	
		Government Boys' Primary School, Gorkin	339.5	35.503911°	72.597684°	
T-4	Kandol Lake Paristan Lake Road	Government Boys' Primary School, Shaho	330.9	35.505953°	72.605237°	
		Government Girls Primary School, Shaho	318.3	35.505965°	72.605241°	
		Utror Mosque	315	35°29'24.96"N	72°28'16.04"E	
T-19	Beshai Meadows Road	Govt. Primary School Gal	333	35°29'11.42"N	72°27'58.94"E	
		Masjid Husnain Kreemain Gul Bela	320	35°28'47.92"N	72°26'56.47"E	
		Government Boys Primary School, Utror	300	35°29'27.51"N	72°28'5.46"E	
Karak	Takhate Nasrati Bridge to Khadda Banda	Utror Mosque	315	35°29'24.96"N	72°28'16.04"E	
		Boyun School	315	35°28'27.8"N	72°36'14.3"E	
		Bilal Masjid Boyun	343	35.472826°	72.605148°	
N-KRK-R2	Road from Hamdan to Inzar More	Boyun School	315	35°28'27.8"N	72°36'14.3"E	
		The Horizon Children Academy, Syed Abad	330	33° 0'42.07"N	71° 4'53.20"E	
		Government Degree College Boys	307	33° 0'30.50"N	71° 4'19.10"E	
RRD-KRK-NR5	Road from Hamdan to Inzar More	Govt Middle School Khada	424	33° 0'42.20"N	71° 3'22.59"E	
		Madrassa Arabia Khada	354	33° 0'27.75"N	71° 3'14.07"E	
		Government Primary School Khadda Banda	305	33° 0'30.42"N	71° 3'6.79"E	
RRD-KRK-R1	Road from Hamdan to Inzar More	Ali Art khattak	349	33° 0'31.46"N	71° 2'2.04"E	
		Jamia Masjid-Bagora	313	33° 0'18.26"N	71° 1'40.31"E	
		Government School Bogara Karak	323	33° 0'27.68"N	71° 1'30.54"E	
RRD-KRK-R1	Road from Hamdan to Inzar More	Government Higher Secondary School Bogara Karak	346	33° 0'23.24"N	71° 1'20.76"E	
		Madrassa Molana Abdul Ghafoor saheb	333	32°57'4.85"N	70°58'12.41"E	
		GPS Inzer Banda - Elementary school	305	32°57'35.98"N	71° 0'48.70"E	
RRD-KRK-R1	Road from Hamdan to Inzar More	Mosque	358	32°57'42.39"N	71° 1'8.84"E	
		Madrassa Jehangiri - Religious school	326	32°57'2.17"N	70°58'14.42"E	
		Dr.Syed Wasimullah Medical Specialist - Clinic	328	33° 2'17.84"N	71° 2'3.57"E	

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Road ID	Road Name	Type of Receptors	Distance for Row m	Google Coordinates		Type of Receptors Latitude
				Longitude	Latitude	
RRD-KRK-R3	Indus Highway to Nari Khawar	Universal Academy of Health Sciences & Technology Chokara Karak	462	33° 2'13.49"N	71° 1'56.65"E	
		Lawaghar institute of medical science chokara karak	481	33° 2'18.30"N	71° 1'53.45"E	
		Girls Primary School	330	33° 3'1.75"N	71° 3'7.03"E	
		Islamic Madrasa	321	33° 3'43.86"N	71° 3'54.77"E	
		Masjid Zikriya	376	33° 4'55.72"N	71° 2'57.27"E	
		Dr.Syed Wasimullah Medical Specialist - Clinic	328	33° 2'17.84"N	71° 2'3.57"E	
		Masjid Umer Farooq	305	32°52'20.18"N	71° 2'1.71"E	
		Govt Primary School Behram Khel	312	32°51'52.22"N	71° 1'9.99"E	
		Masjid Wazir Muhammad	323	32°51'23.33"N	70°59'47.54"E	
		Govt High School Kiridhand	647	32°52'3.19"N	70°58'41.07"E	
		Government Primary School Kiridhand	393	32°51'58.89"N	70°58'51.89"E	
		Masjid Gul Adam Khan	301	32°52'12.61"N	70°59'3.30"E	
		Jamia Tajveed Ul Quran Qari Faiz Ullah Kiridhand	376	32°52'18.74"N	70°59'1.69"E	
RHC Hospital UC Gudikhell	522	32°52'49.94"N	71° 1'38.81"E			
Govt Higher Secondary School Shah Salim(Daberi Banda) -	341	32°52'31.58"N	71° 1'21.98"E			
Chitral						
N-CHT-1	Shesha to Madalcasht Road	Government Primary School Lawi (Double Shift School)	553	35°35'59.92"N	71°49'15.01"E	
		GMPS Laow Da Pukhtano Kalay	529.5	35°39'35.59"N	71°55'27.42"E	
		Aga Khan Girls School Madaklasht	300	35°46'38.15"N	72° 1'51.43"E	
		Govt. Primary School Baybond Madaklasht	304	35°47'44.75"N	72° 3'3.56"E	
		Shishi lower mosque	323	35°35'29.08"N	71°49'21.17"E	
		GPS Shishi - Primary school	347.5	35°35'35.71"N	71°49'42.07"E	
		Shishi Masjid	329	35°35'55.33"N	71°50'7.69"E	
		Tehsil Headquarter Hospital Drosh	366	35°33'17.03"N	71°47'39.58"E	
		Bazar Masjid	204	35°33'22.39"N	71°47'35.41"E	
		Masjid-e-Umar farooq (RA) Osiac	230	35°33'13.78"N	71°46'56.72"E	
		Jamia Masjid,Abubakar Sadique (R.A)	240	35°31'5.31"N	71°44'48.19"E	
		GHS Sweer - High school	284	35°30'39.80"N	71°44'8.76"E	
		Masjid-e-Nimra Osiac	214	35°33'19.06"N	71°46'50.62"E	
Govt Primary School Wemxed -	220	35°29'24.62"N	71°42'3.57"E			
Jamia Mosque Orsoon	217	35°29'38.48"N	71°42'1.41"E			
CHT-2	Osaic To Orsoon Road					

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Road ID	Road Name	Type of Receptors	Distance for RoW		Google Coordinates	Type of Receptors
			RoW	m		
RRD-DIK-NR8	CRBC Canal to Diyal Pahar pur Canal Road & Rehmat Abad Link	GGPS Haji Abad - School Pusha No. 1 Primary School Maarif ul Quran Siddiqiya HissamMaarif ul Quran Siddiqiya Hissam G H S Hissam - High School Govt primary school Jumma Sharif tehsil Prova - Schoo	301 328 457 864		31°57'52.26"N 31°57'41.91"N 31°57'3.64"N 31°56'55.46"N	70°51'8.22"E 70°50'46.02"E 70°53'2.45"E 70°52'47.67"E
RRD-DIK-NR12	Jhandi Sewaag Road	Masjid Hazrat Bilal(R.A) Astana Aliya peer Mustawar Masjid e Sultania Darbar Hazrat Sultan Ghulam Bahoo GMPS Kotha Dirkhan - School G P S Kot Musa Rehmania Masjid (Jataan wali) Chaudwan Public School	301 320 321 351 314 410 414 926 301		31°42'15.61"N 31°42'4.85"N 31°42'14.23"N 31°42'14.63"N 31°42'13.04"N 31°33'45.78"N 31°35'7.00"N 31°35'45.42"N 31°36'9.82"N	70°40'17.72"E 70°40'42.74"E 70°40'28.24"E 70°40'30.34"E 70°40'30.83"E 70°28'57.16"E 70°25'15.85"E 70°21'21.98"E 70°21'31.58"E
RRD-DIK-R1	Prova to Chowdwan Road	GHS Parwara - High School	373		31°32'10.79"N	70°9'10.40"E
RRD-DIK-R6	Main Parwara Jalal Khell Road	Sheru Kohna School BHU Sheru Kohna Sheru Kohna Graveyard Sheru Kohna High School Masjid Ali DI Khan Airport Govt. Primary School Aheer Abad Mosque	107 115 350 90 146 100 650 460		31°48'2.94"N 31°47'47.87"N 31°47'57.44"N 31°47'47.79"N 31°47'24.87"N 31°54'35.12"N 31°54'10.17"N 31°56'0.14"N	70°37'21.94"E 70°37'16.33"E 70°37'24.55"E 70°37'15.28"E 70°36'58.17"E 70°53'16.03"E 70°53'37.86"E 70°54'58.44"E
KPR_DIK_NR_11	Main N-50 to Shero Kuhna Road	Falcon Public High school Naivela FPS & Cadet Coaching Academy Naivela Imperial Public School Chah Hussain The Cader School Sardary Wala Road Govt. Primary School Sardary Wala Govt. Middle School Sardary Wala Masji Qari Hanan Thatha Balocha Govt. Girls School Thatha Balocha Grid Station Bund Kurai Girls Primary School Musa Khar Govt. Boys Primary School Thathal	196 25 84 95 38 330 1098 1107 309 45 374		31°37'30.67"N 31°37'25.74"N 31°36'21.48"N 31°58'37.41"N 31°59'5.17"N 31°59'5.03"N 31°59'54.52"N 31°59'41.50"N 32°1'57.56"N 31°57'46.81"N 31°58'2.30"N	70°46'50.69"E 70°46'48.68"E 70°46'26.38"E 70°57'57.11"E 70°57'24.84"E 70°57'13.86"E 70°56'14.33"E 70°56'17.23"E 70°53'35.17"E 70°59'20.39"E 70°59'8.74"E
KPR_DIK_NR_13	Main N-55 to Diyal via Airport Road					
RRD_DIK_NR_4	Indus Highway to Dhok Rabnawaz and Chah Hussain Road					
RRD_DIK_NR_5	Main Chashma road, Thathal Adda to Phahar Pur Old Canal Road					
RRD_DIK_NR_6						

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Road ID	Road Name	Type of Receptors	Distance for RoW m	Google Coordinates		Type of Receptors	
				Longitude	Latitude		
RRD_DIK_NR_7	Chashma Road to Village Musa Khar and Jabbar wala Road	Jamia Mosque thathal	394	31°58'5.23"N	70°58'53.36"E		
		Govt. Middle School Thathal	443	31°57'39.64"N	70°58'38.12"E		
		Fazal Abad Graveyard	98	31°57'51.56"N	70°57'42.53"E		
		Jamia Masjid Jabbar Wala	202	31°58'23.45"N	70°56'28.34"E		
		Govt. Higher Secondary School Awan	74	32° 1'26.28"N	70°57'56.98"E		
		Govt. Primary School Risaldar Abad	690	32° 2'10.73"N	70°56'33.00"E		
		Bright Future Public School Mahsood Abad	402	32° 2'43.78"N	70°56'0.14"E		
		Govt. Girls Primary School Rack Civil	567	32° 3'12.50"N	70°56'21.72"E		
		Govt. Primary School Garrah Rehman	249	31°58'3.52"N	70°47'47.20"E		
		RRD_DIK_NR_9	Pusha Pul to Garrah Rehman Road	Oxford Model Public School and College Pusha Pull	216	31°57'36.49"N	70°50'32.67"E
RRD_DIK_NR_14	Giloti Road	Madrasa Jamia Imam Azam	222	31°57'36.53"N	70°50'29.19"E		
		PTCL Exchange Pusha Pull	243	31°57'33.13"N	70°50'44.76"E		
		Police Station Giloti	567	32°10'42.84"N	70°45'48.18"E		
		Giloti Graveyard and Mosque	25	32°10'18.72"N	70°45'35.12"E		
		Wasti Mosque Giloti	96	32°10'6.50"N	70°45'18.94"E		
		Govt. High School Giloti	211	32° 9'59.86"N	70°44'55.29"E		
		Govt. Primary School Kirri Malang	465	32° 8'1.37"N	70°39'52.39"E		
		Masjid Alkausar Takwara	417	32° 9'1.29"N	70°38'16.34"E		
		Khyber Public School Takwara	450	32° 8'38.62"N	70°37'34.53"E		
		Madrasa Dar-ul-Elam Walhuda Hathala	33	32° 3'14.35"N	70°34'24.18"E		
RRD_DIK_R_4 Haripur	Mian Kasirai Shareef Road (Darazinda) Road	Govt. Girls School Hathala	58	32° 3'7.62"N	70°34'16.66"E		
		Graveyard Hathala	142	32° 2'56.22"N	70°34'4.76"E		
		Govt. Higher Secondary School Hathala	51	32° 2'49.41"N	70°34'10.68"E		
		Jamia Masjid Noori Darbar Kolachi	430	31°55'47.11"N	70°27'15.28"E		
		Jamia Masjid Anwar-E-Bahoo Kolachi	414	31°55'34.41"N	70°27'16.28"E		
		Govt. Primary School No.1 Kot Essa Khan	75	31°47'40.04"N	70°23'16.26"E		
		Village Hall Zorr Shehar	404	31°42'18.33"N	70° 6'37.76"E		
		Khaisarai sharif village Hall	392	31°40'2.06"N	70° 3'15.60"E		
		T7	Noori Waterfall Road	Govt. English Medium Elementary School Tial	320	33°53'38.43"N	73° 7'40.07"E
		T-35	Nara Akhoon Khail Waterfall Road	Govt Primary School Nara Mahroofiyan	330	34°3'46.51"N	72°50'51.89"E
Government Pakistan College	356			34°3'26.19"N	72°51'28.01"E		
GMS New Momaiya Haripur	323			34° 3'24.10"N	72°51'24.57"E		
Government Primary School New Mumaiya	341			34° 3'1.52"N	72°51'28.00"E		
Punjab College Haripur	318			34° 2'25.00"N	72°51'5.70"E		

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				Longitude	Latitude	
HRI-17	Anar Gah Road	Afghan refugee school	341	34° 2'5.32"N	72° 50'43.19"E	
		Javed Homeopathic Clinic	414	34° 1'17.71"N	72° 49'20.04"E	
		Govt Primary School Sarri	364	34° 1'32.08"N	72° 49'39.78"E	
		Government High School	301	34° 1'29.15"N	72° 49'38.92"E	
		Jamia Masjid Basso Maira	331	34° 1'30.81"N	72° 50'38.41"E	
		Jamia Masjid Nara	326	34° 3'54.36"N	72° 51'25.69"E	
		Govt Primary School Nara Akhoonkhail	352	34° 3'57.33"N	72° 51'29.90"E	
		Jamia Masjid Khairoch	205	34° 2'37.64"N	72° 48'42.98"E	
		GMS & GPS Khairoch - School	224	34° 2'32.12"N	72° 49'4.66"E	
		Torh Garh		Government Primary school Sulemani Madakhail	213	34°26'13.72"N
GPS Adam Zareef Madakhail - Primary school	225			34°26'7.11"N	72° 44'50.88"E	
TGH-1	Karrak Madakhel to Hasan Zai Road	Madrasa Taleem-o-Quran, Manjakot	235	34°27'6.38"N	72° 47'22.12"E	
		Gps Manjakot - Schoo	448	34°26'56.47"N	72° 47'22.82"E	
Swabi		Masjid Sayedan Palosa	219	34°30'1.93"N	72° 48'41.15"E	
		Madrasa Umul Qura Hassan Zai	254	34°30'0.94"N	72° 48'53.01"E	
T-2	Beer Gali Road	Government Higher secondary school Utlia	233	34°15'57.71"N	72° 41'51.30"E	
		Basic Health Unit Gabasni	205	34°16'1.30"N	72° 42'29.10"E	
		Govt Middle School Bori Beergali	228	34°17'12.51"N	72° 43'17.40"E	
		Jamia Masjid Mazghund Gadoon	1679	34°16'22.06"N	72° 39'46.33"E	
		GPS Mazghund -Elementary school	1979	34°16'23.95"N	72° 39'36.41"E	
Mansehra	Sharan Forest Road	Govt Primary School Akori	615	34°15'51.85"N	72° 40'44.41"E	
		GPS Bela Paras - Primary School	350	34°40'1.86"N	73° 26'38.08"E	
Malakand	Landi Shah to Narrai Uba	Masjid Landi Shah	323	34°24'13.22"N	71° 47'6.04"E	
		GHS Landi Shah (School)	338	34°24'18.05"N	71° 47'9.49"E	
CHR-4	Landi Shah to Narrai Uba	GPS landi shah - Elementary school	339	34°24'17.47"N	71° 46'46.83"E	
		Government high school hazrat manan kalay	300	34°25'26.36"N	71° 46'53.12"E	
		G.P.S Narai Obu - Primary school	308	34°26'46.58"N	71° 46'43.36"E	
		Masjid Tawheed Mera Khan Klai	739	34°25'0.82"N	71° 47'21.98"E	
MLK-4	Mura Banda Link Road	Government high school bazdara payan - High school	333	34°32'16.46"N	72° 8'26.92"E	
		Madrasa Talimul Quran - Mosque	300	34°32'19.51"N	72° 8'12.65"E	

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Road ID	Road Name	Type of Receptors	Distance for RoW m	Google Coordinates		Type of Receptors Latitude
				Longitude	Latitude	
MLK-7	Neher Quarter to Jaban Power House	Government Girls primary school Bazdara Payyan - Primary school	349	34°32'24.67"N	72° 8'19.46"E	
		Govt Primary School Karimabad	319	34°32'43.83"N	72° 7'14.09"E	
		GMS Morabanda - Primary school	327	34°33'51.70"N	72° 6'46.83"E	
		Masjid-e-Bilal	512	34°30'54.42"N	71° 53'39.02"E	
		Dargai Power House	414	34°30'50.93"N	71° 54'14.32"	
		Palosai Baba - Mosque	448	34°31'30.22"N	71° 53'55.04"E	
		Haider Zaman Masjid	372	34°31'27.50"N	71° 54'22.52"E	
		Masjid-E-Quba	873	34°32'11.89"N	71° 53'51.87"E	
		Riphah International College Dargai Campus	770	34°31'55.02"N	71° 53'54.97"E	
		FIMS College of Nursing & Health Sciences	761	34°31'51.00"N	71° 53'53.88"E	
		Masjid Hazrat Ali Pir Abad	436	34°31'45.60"N	71° 54'4.88"E	
		GGMS Jaban - Middle school	310	34°31'38.06"N	71° 54'20.34"E	
		Govt Middle School Jabban	305	34°32'18.94"N	71° 54'24.50"E	
		Al Fajar Education System, Dargai - College	568	34°30'45.89"N	71° 53'36.08"E	
N-MLK-1	Daragai - Palai Interchange Swat Motorway	BHU Kharkai (Basic Health Unit Kharkai)	1159	34°30'43.05"N	71° 53'12.57"E	
		Government Post Graduate College	305	34°30'32.73"N	71° 54'34.35"E	
		Dargai Government Degree College	310	34°30'34.10"N	71° 54'33.84"E	
		Khyberpaktunkhwa Small Industrial Estate	303	34°30'37.16"N	71° 55'1.11"E	
		Ranezai Institute of Medical Sciences	393	34°30'45.30"N	71° 55'6.48"E	
		Dargai Camp Jamai Masjid	315	34°29'52.63"N	71° 55'39.02"E	
		Madrasa Sheikh u Islam Ibn Timiya	346	34°29'46.83"N	71° 55'47.51"	
		Jigdaliwalow masjid	680	34°29'58.58"N	71° 56'4.11"E	
		Government High School Gul Maqam	329	34°29'8.18"N	71° 55'7.79"E	
		Khado Pull Masjid	303	34°28'13.20"N	71° 57'47.33"E	
		Bado Baba Masjid Muslimabad	397	34°29'25.97"N	71° 55'24.23"E	
		Government Girls High school Malo Shah (GGHS)	694	34°27'52.26"N	71° 58'0.21"E	
		Aqsa Masjid	330	34°28'27.52"N	71° 59'9.70"E	
		Jamia masjid Al Khadra	369	34°29'15.53"N	72° 0'54.54"E	
N-MLK-2	Badraga to Jazoona Dag Road	kakai Baba Mosque	309	34°29'32.53"N	72° 1'5.68"E	
		Pitaw-Pharmacy	300	34°28'43.33"N	71° 56'8.12"E	
		Masjid Torzai Ikrampur	480	34°29'41.72"N	72° 0'54.71"E	
		Oxford Public School & College - Ikrampur	352	34°29'30.18"N	72° 0'44.47"E	
		Government High School Badraga	640	34°23'18.32"N	71° 50'54.82"E	
		Masjid Aqsa	712	34°23'22.32"N	71° 51'0.15"E	
		Koper Malakand Hospital	1088	34°24'24.43"N	71° 50'11.56"E	

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Road ID	Road Name	Type of Receptors	Distance for RoW	Google Coordinates		Type of Receptors
				Longitude	Latitude	
Kohistan		Government Degree College Badraga	323	34°23'42.82"N	71°50'36.49"E	
		Government Primary School Bajouro Kala	345	34°24'22.52"N	71°51'17.85"E	
		Dilwar kaly Mosque	710	34°24'49.48"N	71°51'4.59"E	
		Govt. Primary School Kachi Kalay	320	34°24'37.64"N	71°51'39.85"E	
		G.G.M.S Kachi kalay (School)	417	34°24'33.56"N	71°51'51.29"E	
RRD-LKH-R1		GPS Kareen Bataira - Primary school	305	34°57'24.70"N	72°54'4.44"E	
		Madina Masjid Karim Abad battaira	320	34°57'8.01"N	72°53'39.12"E	
	Batera Road	Basic Health Unit Batera - Hospital	329	34°56'52.52"N	72°53'5.36"E	
		Govt High School Batera - School	337	34°56'47.06"N	72°53'7.19"E	
		Jamia Islamia& Masjid Salman Farsi Besham	317	34°55'21.79"N	72°52'42.53"E	
		Faizan Public School And College	653	34°54'15.01"N	72°51'37.65"E	
		Govt Boys Primary School Sair Ghaziabad Palas	333	35° 6'3.37"N	73° 0'14.07"E	
		Govt Middle School for Boys Sair Ghaziabad Palas	345	35° 6'3.58"N	73° 0'8.92"E	
	Pattan Ziarat Road	Kohistan International Public School and College Palas	315	35° 6'8.86"N	73° 0'9.37"E	
		Pallas Health Care Center - Hospital	309	35° 6'9.45"N	73° 0'0.31"E	
RRD-LKH-R2		Govt Boys Primary School Sair	333	35° 6'3.37"N	73° 0'14.07"E	
		GMS Banil Qilla-School	320	35° 8'49.76"N	72°58'33.44"E	
	Chawa Darra Road and Renolia Road Tehsil	RHC - Hospital	442	35° 6'33.12"N	73° 0'24.66"E	
		GHS Pattan – School	550	35° 6'27.74"N	73° 0'16.93"E	
		Meer College - University	672	35° 6'28.09"N	73° 0'27.68"E	
		GGMS Jalkot - Middle School	325	35°15'11.80"N	73°13'9.49"E	
		BHU Jalkot	372	35°14'49.71"N	73°12'44.62"E	
		Masjid Muslim Abad	346	35°13'15.66"N	73°12'28.78"E	
		GGMS Jalkot - Middle School	325	35°15'11.80"N	73°13'9.49"E	
		Faizan Public School And College	653	34°54'15.01"N	72°51'37.65"E	
RRD-UKH-R1						
Dir		GGPS bandagai - Primary school	208	34°53'7.41"N	71°53'59.93"E	
		Masjid Abubaqar Bandagai	243	34°52'57.65"N	71°54'0.58"E	
	Sar Banda Munjai Top Road	Aseer Abad School	471	34°52'51.29"N	71°53'30.22"E	
		Masjid Oliyabanda	262	34°53'34.96"N	71°54'12.60"E	
		Government High School Manzbanda Munjai Dir	220	34°53'44.89"N	71°54'4.09"E	
		GPS Sarbanda	250	34°54'27.31"N	71°54'23.72"E	
		GHS Kumar-School	236	34°57'35.49"N	71°49'10.67"E	

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Road ID	Road Name	Type of Receptors	Distance for RoW m	Google Coordinates		Type of Receptors
				Longitude	Latitude	
DRL-35		Masjid Aqsa Jabgi Maidan	228	34°57'46.53"N	71°49'36.59"E	
		GPS shagai Markhanai Maidan-School	203	34°57'46.35"N	71°50'26.68"E	
		Jamiat-ul-Mohsinat, Gulshan Abad, Murkhani Maidan	220	34°58'3.95"N	71°50'40.14"E	
		Qazi Mosque	203	34°58'9.33"N	71°50'53.85"E	
		GPS Khatkay Maidan-School	230	34°58'15.67"N	71°50'49.96"E	
		Govt. Higher Secondary School (Boys) Bagh Maidan	339	34°58'37.68"N	71°50'39.53"E	
		Govt. Primary School Bagh Maidan for Boys	205	34°58'58.37"N	71°51'27.44"E	
		Bishgram Hospital	962	34°58'49.04"N	71°50'18.37"E	
		GPS Ranamanzai Dir Lower- School	459	34°58'39.93"N	71°51'54.03"E	
		Malik Pharmacy & First Aid Center	231	34°57'52.99"N	71°50'26.11"E	
		Zimdara Police station - Hospital	212	35°0'51.05"N	71°47'17.75"E	
		Hira High School Zaimdara	266	35°0'45.87"N	71°47'19.47"E	
		Ameen Education System-School	379	35°0'39.96"N	71°46'59.38"E	
Government Primary School girls Sroo Gal	226	35°1'15.19"N	71°46'18.14"E			
Government Primary School Didan Pora	235	35°1'17.47"N	71°45'54.97"E			
Rising Star Public School Lacha Maidan	220	35°1'40.41"N	71°45'46.88"E			
Madrassa Mazhar Ul Uloom	203	35°1'40.18"N	71°45'19.50"E			
Ghs molvi sultan khail sahib abad - School	245	35°1'7.21"N	71°56'53.39"E			
Jamia Masjid Molvi	207	35°1'4.22"N	71°57'8.38"E			
GPS Razagay - Elementary school	202	35°0'41.51"N	71°56'21.11"E			
Gps Korbatan - School	201	35°2'17.78"N	72°8'7.14"E			
Mosque Matar Bar Kalay	220	35°1'59.90"N	72°8'57.69"E			
Government Primary School Matar No1	438	35°2'16.21"N	72°8'32.48"E			
Kantu Top Masjid	206	35°9'58.94"N	72°6'26.48"E			
Ali Gasar Medical Center - General hospital	235	35°10'46.83"N	72°6'12.76"E			
Power plant - Hydroelectric power plant	218	35°11'39.63"N	72°6'17.83"E			
GHS Alli Gasr - School	294	35°10'53.68"N	72°5'59.61"E			
Kas Mosque	372	35°9'34.75"N	72°7'0.85"E			
Miana Mosque	678	35°9'32.24"N	72°7'12.56"E			
GGPS Usheri-School	243	35°9'56.64"N	72°7'39.14"E			
Usheri Mosque	205	35°9'52.17"N	72°7'37.35"E			
Al-Hasnin	626	35°9'27.52"N	72°8'37.66"E			
The Green Hill Public School Shorshing	231	34°49'39.25"N	72°6'46.15"E			
Jamie Masjid Manrai	229	34°50'3.02"N	72°6'43.95"E			
RRD-DRU-NR3	Katigram To Shagai U/C Kotke					
RRD-DRU-NR4	Sundrai to Qadarkandow Road					
RRD-DRU-R1	Usherai Dara Link Roads (Link-A)					
RRD-DRU-R1	Usherai Dara Link Road (Link-B)					
RRD-DRL-NR1	Shorshing Jakra Baba Road					

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			RoW	m		
		GPS Shorshing - Elementary school		201	34°50'18.79"N	72° 7'4.96"E
		Jamia Masjid Khush'hal Paty		217	34°50'50.22"N	72° 7'51.04"E
		GPS Bagh No. 2-Elementary school		276	34°50'39.60"N	72° 7'30.91"E
		Madrisa Manrai Shorshing		204	34°50'3.30"N	72° 6'55.28"E
		The Green Hill Public School Shorshing		231	34°49'39.25"N	72° 6'46.15"E


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4.4 Ecological Environment

4.4.1 Flora of Proposed Project

140. Ecological surveys were conducted at all roads and bridges for the study of flora. The identification of the plants and labelling of Herbarium sheets carried out by using Flora of Pakistan (Ali and Qaiser, 1992-2007; Ali and Nasir, 1990-92).

4.4.2 Flora Sampling Methodology

141. The sites based upon the presence of natural vegetation selected and surveyed through Transect walks. Within each sample plot, all plants were divided into four layers, i.e., tree, shrub, herb, grass and Pteridophytes. The size of sample was 100 m² at each sampling site. A long measuring tape (25m) was laid across the stand in the communities under study and fixed with two hooks at two ends. The individual plants recorded touching the measuring tape and the distance from a particular end. For abundance and measurement 10×10m, quadrats were used for tree vegetation, 5×5m quadrats for shrubs and 1×1m were taken for herbs and grasses.

4.4.3 Flora Data Analysis and Interpretations

142. The abundance of species in the project areas was determined using the DAFOR scale (table 4.5). Specifically, the Dominant, Abundant, Frequent, Occasional, Rare and Absent (the DAFOR) scale records the vegetative cover of an area and represents the abundance of species (Hearnshaw *et al* 2010). DAFOR scale is presented in below table.

Table 4-10: DAFOR Scale to analyze abundance

Abundance (% age)	DAFOR Class	Abbreviation
51 – 100	Dominant	D
31 – 50	Abundant	A
16 – 30	Frequent	F
6 – 15	Occasional	O
1 – 5	Rare	R
0	Absent	X

143. Being an easily and widely understood system for classifying species at high risk of global extinction was used. The general aim of the system is to provide an explicit, objective framework for the classification of the broadest range of species according to their extinction risk. However, while the Red Data List may focus attention on those taxa at the highest risk, it is not the sole means of setting priorities for conservation measures for their protection.

4.4.4 Flora Surveys Outcomes

144. The roads falling in Haripur area were studied for flora diversity. Herb diversity on these roads exhibited counts of 4, 4, and 5 species, respectively, while grasses were observed in counts of 4, 2, and 4 along the same roads. Additionally, sedges and Pteridophytes were noted along roads HRI-17, T-7, and T-35 in varying quantities, with counts of 4, 5, and 4 for sedges and 3, 3, and 3 for Pteridophytes, respectively (table 4.6, figure 4-13).

145. In Kohistan five roads, RRD-LKH-R1, RRD-LKH-R2, RRD-LKH-R3, RRD-LKH-R4, and RRD-LKH-R1 have been shortlisted. Observations on these roads revealed 6, 5, 3, 6, and

4 trees, 3, 3, 3, 4 and 3 shrubs, 4, 5, 6, 5, and 4 herbs, 5, 6, 7, 4, and 2 grasses, 2, 4, 1, 4, and 3 sedges, and 1, 1, 1, 2, and 1 Pteridophytes species respectively (table 4.6, figure 4-13). Specifically, the district comprises roads MAN-2, T-12 and T-22. These roads were observed by varying quantities of tree species, with counts of 6, 5, and 6, respectively. Similarly, shrub counts along these roads were 3, 5, and 4, respectively. Herb diversity on these roads exhibited counts of 4, 4, and 7 species, respectively, while grasses were observed in counts of 3, 3, and 3 along the same roads. Additionally, sedges and Pteridophytes were noted along roads MAN-2, T-2 and T-22 in varying quantities, with counts of 2, 2, and 2 for sedges and 1, 1, and 2 for Pteridophytes, respectively.

146. In Tor Garh of only one road selected, TGH-1, circulating around mountains. The road studied in this district was abundant in vegetation. The number of trees reported around the road was 81, accompanied by 40 shrubs, 51 herbs, 28 grasses, 5 sedges, and 3 Pteridophytes species (table 4.6, figure 4-13).

Table 4-11: Flora of Haripur, Kohistan, Torgarh, Mansehra Subprojects

Sr. No.	Scientific Names	Common Names	Families	Districts			DAF or Scale	IUCN Red List Status
				Haripur	Kohistan	Manshera		
TREES								
1	<i>Acacia arabica</i>	Acacia	Fabaceae	✓	X	✓	X	NE
2	<i>Ailanthus altissima</i>	Ailanthus	Simarubaceae	X	✓	✓	✓	NE
3	<i>Ailanthus excelsa</i>	Heaven tree	Simarubaceae	✓	X	✓	✓	NE
4	<i>Dalbergia sissoo</i>	Indian rosewood	Fabaceae	✓	✓	X	✓	LC
5	<i>Ehretia laevis</i>	Pataki/Chamror	Boraginaceae	X	✓	✓	✓	DD
6	<i>Eucalyptus sp.</i>	Eucalyptus	Myrtaceae	✓	X	X	X	LC
7	<i>Pinus roxburghii</i>	Pinus	Pinaceae	✓	X	X	X	LC
8	<i>Polyalthia longifolia</i>	Ashok	Annonaceae	✓	✓	✓	✓	NE
9	<i>Robinia pseudoacacia</i>	Robinia	Fabaceae	✓	✓	✓	✓	LC
10	<i>Thuja occidentalis</i>	Saroo	Cupressaceae	✓	✓	✓	✓	LC
11	<i>Ziziphus jujuba</i>	Jujube	Rhamnaceae	X	✓	X	X	LC
SHRUBS								
1	<i>Asparagus falcatus</i>	Asparagus	Liliaceae	✓	✓	✓	✓	NE
2	<i>Duranta repens</i>	Pigeon berry	Verbenaceae	✓	✓	✓	X	NE
3	<i>Lawsonia inermis</i>	Heena	Lythraceae	X	X	✓	✓	LC
4	<i>Manihot esculenta</i>	Cassava	Euphorbiaceae	✓	X	X	✓	NE
5	<i>Murraya exotica</i>	Orange jasmine	Rutaceae	✓	✓	✓	✓	LC
6	<i>Withania somnifera</i>	Poison gooseberry	Solanaceae	✓	✓	✓	X	NE
7	<i>Yucca aloifolia</i>	Aloe yucca	Asparagaceae	✓	X	✓	✓	DD
8	<i>Ziziphus nummularia</i>	Lotebush	Rhamnaceae	✓	✓	✓	✓	NE
HERBS								
1	<i>Achyranthes aspera</i>	Devil's horsewhip	Amaranthaceae	X	✓	X	✓	NE
2	<i>Agave americana</i>	Century plant	Asparagaceae	✓	✓	✓	✓	LC
3	<i>Calotropis procera</i>	Apple of sodom	Apocynaceae	✓	✓	✓	✓	NE
4	<i>Canna indica</i>	Edible canna	Cannaceae	✓	✓	✓	✓	NE
5	<i>Cannabis sativa</i>	Bhang	Canabaceae	✓	✓	✓	✓	NE
6	<i>Convolvulus arvensis</i>	Convolvulus	Convolvulaceae	X	✓	X	✓	NE
7	<i>Conyza ambigua</i>	Butterweed	Asteraceae	✓	✓	✓	✓	NE
8	<i>Conyza canadensis</i>	Fleabane	Asteraceae	X	X	X	X	NE
9	<i>Oxalis corniculata</i>	Oxalis	Oxalidaceae	✓	✓	✓	✓	NE
10	<i>Parthenium hysterophorus*</i>	Gajar boti	Asteraceae	✓	✓	✓	✓	NE
11	<i>Verbascum thapsus</i>	Jackal tobacco	Scrophulariaceae	✓	✓	✓	✓	NE
12	<i>Xanthium strumarium</i>	Rough cocklebur	Solanaceae	✓	✓	✓	✓	NE
GRASSES								
1	<i>Arundo donax</i>	Giant reed	Poaceae	✓	✓	✓	✓	LC
2	<i>Brachiaria reptans</i>	Running grass	Poaceae	X	X	✓	✓	LC

Sr. No	Scientific Names	Common Names	Families	Districts				Tor Ghar	DAF or Scale	IUCN Red List Status
				Haripur	Kohistan	Manshera				
3	<i>Cenchrus biflorus</i>	Cenchrus	Poaceae	✓	✓	X		X	O	NE
4	<i>Digitaria ciliaris</i>	Crabgrass southern	Poaceae	✓	✓	✓		✓	A	NE
5	<i>Poa annua</i>	Poa grass	Poaceae	✓	✓	X		X	F	LC
6	<i>Polypogon monspeliensis</i>	Asian beardgrass	Poaceae	✓	✓	✓		✓	A	LC
SEDGES										
1	<i>Carex fedia</i>	Carex	Cyperaceae	✓	X	✓		✓	A	NE
2	<i>Cyperus compressus</i>	Annual sedge	Cyperaceae	✓	✓	✓		✓	F	LC
3	<i>Cyperus compactus</i>	Flat sedge	Cyperaceae	✓	✓	X		✓	O	LC
4	<i>Cyperus niveus</i>	Snow white	Cyperaceae	✓	✓	✓		✓	F	NE
5	<i>Cyperus rotundus</i>	Nut sedge	Cyperaceae	✓	✓	✓		✓	D	LC
PTERIDOPHYTA										
1	<i>Marsilea minuta</i>	Water clover	Marsileaceae	✓		✓		✓	A	LC
2	<i>Marsilea quadrifolia</i>	Water shamrock	Marsileaceae	✓	✓	✓		✓	F	LC
3	<i>Adiantum capillus-veneris</i>	Maiden hair Fern	Pteridaceae	✓	✓	✓		✓	O	LC
4	<i>Pteris vittata</i>	Ladder Brake	Pteridaceae	✓	✓	✓		X	F	LC

* = Invasive, **=Rare, D = Dominant, A= Abundant, F= Frequent, O = Occasional and R=Rare X= Absent. IUCN Red List Status: EN = Endangered, NT = Near Threatened, VU=Vulnerable, LC=Least Concern, NE=Not Evaluated DD= Data Deficient


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Figure 4-15: Flora of Hazara Division

- 147. As per the floral regional distributions, the Bunner, Chitral, Dir lower, Dir upper, Malakand, Shangla and Swat falls in Malakand floral division.
- 148. In Bunner three roads, N-BUN-2, BUN-9 and BUN-11. On the first road, N-BUN-2, the total observed species were 9 trees, 4 shrubs, 5 herbs, 3 grasses, 2 sedges, and 1 Pteridophytes. Conversely, the other roads, BUN-9 and BUN-11 exhibited observed species counts of 6, 5 trees, 4, 6 shrubs, 4, 3 herbs, 3, 3 grasses, 2, 2 sedges, and 2, 1 Pteridophytes, respectively (table 4.7, figure 4-14).
- 149. In Chitral nine roads known as N-CHT-1, N-CHT3, N-CHT-4, N-CHT-5, N-CHT-6, N-CHT-7, N-CHT-8, and N-CHT-9 and RRD-UCH-NR1. The observed species along the roads ere were 7, 6, 5, 7, 8, 7, 6, 5, and 8 trees, 4, 3, 3, 3, 4, 3, 4, 4 and 5 shrubs, 4, 4, 5, 3, 3, 5, 4, 4, and 4 herbs, 3, 3, 3, 2, 3, 3, 2, 2 and 3 grasses, 2, 2, 2, 2, 3, 2, 4, 2, and 3 sedges, and 2, 1, 2, 2, 1, 2, 2, 2 and 1Pteridophytes (table 4.7, figure 4-14).
- 150. In Dir Lower six roads: DRL-4, DRL-35, RRD-DRL-NR1, T-3, T-31, and T-30. The observed tree species on these roads were 9, 3, 6, 5, 4, and 4, respectively. The shrubs observed on roads DRL 4, DRL35, RRD-DRL-NR1, T-3, T-31, and T-30 were 4, 3, 2, 3,

- 4, and 4, respectively, while herbs were observed in counts of 4, 3, 3, 3, 3, and 3 species, respectively. Regarding grasses, diversity was noted on roads DRL-4, DRL-35, RRD-DRL-NR1, T-3, T-31, and T-30 with counts of 3, 3, 5, 2, 3, and 4 species, respectively. Sedges were observed on DRL 4 and T-30, with 2 species each, and on DRL35, RRD-DRL-NR1, and T-3, while only one sedge species was observed on DRL35. Pteridophytes recorded on roads DRL-4, RRD-DRL-NR1, DRL35, T-3, T-31, and T-30 were 1, 2, 2, 1, 1, and 2 species, respectively (table 4.7, figure 4-14)
151. In Dir upper five roads, RRD-DRU-R1, RRD-DRU-NR3, RRD-DRU-NR4, T-42 and T-43. The observed numbers of trees on these roads were 8, 5, 6, 6 and 6, while shrubs were observed in counts of 3, 4, 3, 3 and 4, respectively. Herb counts were 3, 4, 5, 5 and 5, while grasses were observed in counts of 2, 3, 3, 3 and 3. Sedges were observed in counts of 1, 2, 3, 3 and 1, and Pteridophytes were observed in counts of 2, 1, 1, 2 and 2, respectively (table 4.7, figure 4-14).
 152. IN Malakand five roads: CHR-4, MLK-1, MLK-2, MLK-4 and MLK-7, located at different elevations. The observed numbers of flora on these roads were as follows: for trees, 7 on CHR-4, 8 on MLK-1, and 5, 7, and 7 on MLK-2, MLK-4 and MLK-7; for shrubs, 3 on CHR-4, 2 on MLK-1, and 4, 4, 3 on MLK-2, MLK-4 and MLK-7; for herbs, 4 on CHR-4, 3 on MLK-1, and 3, 2, 3 on MLK-2, MLK-4 and MLK-7; for grasses, 3 on CHR-4, 2 on MLK-1, and 2, 4, and 3 on MLK-2, MLK-4 and MLK-7; for sedges, 1 on CHR-4, 1 on MLK-1, and 1, 1, and 2 on MLK-2, MLK-4 and MLK-7; and for Pteridophytes, 1 on CHR-4, 2 on MLK-1, and 1,2, and 1 on MLK-2, MLK-4 and MLK-7 (table 4.7, figure 4-14).
 153. In Shangla thirteen roads: SNG-7, SNG-14, SNG-20, SNG, 22, SNG, 26, SNG, 26, SNG, 28, SNG, 27, SNG, 29, SNG, 30, SNG, 33, SNG, 60, and SNG-61. The observed flora diversity on these roads included tree species counts of 7, 6, 5, 7, 8, 7, 5, 6, 7, 7, 8, 6, and 7 respectively. Shrub counts were 4, 3, 4, 3, 3, 3, 4, 3, 4, 2, 4, and 3, respectively. Regarding herbs, counts were 5, 3, 4, 3, 3, 5, 5, 5, 2, 3, 4, 4, and 5 respectively. Grass counts were 4, 2, 2, 4, 2, 4, 3, 4, 3, 4, 2, 3 and 2. Sedge and Pteridophytes counts on the roads were observed as 2, 2, 2, 2, 1, 2, 1, 1, 2, 2, 1, 2, and 2 and 1, 2, 1, 1, 1, 1, 1, 1, 2, 1, 1, 2, and 1, respectively (table 4.7, figure 4-14).
 154. Swat includes six roads: N-SWT-T2, N-SWT-T3, N-SWT-T4, SWT-5 T-4 and T-19. The observed flora on these roads included tree species counts of 6, 6, 7, 5, 5, and 7. Shrub counts were 3 on N-SWT-T2, 5 on N-SWT-T3, 3 on N-SWT-T4, 3 on SWT-5, 4 on T-4 and 3 on T-19. Regarding herbs, counts were 7 on N-SWT-T2, 6 on N-SWT-T3, 4 on N-SWT-T4, 7 on SWT-5, 4 on T-4, and 4 on T-19. Grass counts were 3 on N-SWT-T2, 4 on N-SWT-T3, 4 on N-SWT-T4, 3 on SWT-5, 4 on T-4, and 2 on T-19. Sedge and Pteridophytes counts on the roads were observed as 2 and 1 on N-SWT-T2, 1 and 1 on N-SWT-T3, 1 and 1 on N-SWT-T4, 2 and 2 on SWT-5, 1 and 1 on T-4 and 2 and 2 on T-19, respectively (table 4.7, figure 4-14).

Table 4-12: Flora of Subprojects Bunner, Chitral, Dir lower, Dir upper, Malakand, Shangla and Swat Subprojects

Sr. No	Scientific Names	Common Names	Families	Districts						DAFOR Scale	IUCN Red List Status
				Bunner	Chitral	Dir Lower	Dir Upper	Malakand	Shangla		
TREES											
1	<i>Achyranthes aspera</i>	Devil's horsehip	Amaranthaceae	X	✓	✓	✓	X	✓	✓	NE
2	<i>Bombax malabaricum</i>	Cotton silk tree	Bombacaceae	✓	X	✓	✓	✓	✓	✓	LC
3	<i>Eriobotrya japonica</i>	Loquat	Rosaceae	✓	✓	X	X	✓	✓	✓	NE
4	<i>Juglans regia</i>	Walnut	Juglandaceae	✓	✓	✓	✓	✓	✓	✓	LC
5	<i>Olea europaea</i>	Wild olive tree	Oleaceae	✓	✓	✓	✓	✓	✓	✓	NE
6	<i>Pinus roxburghii</i>	Pinus	Pinaceae	✓	✓	X	X	✓	X	X	LC
7	<i>pinus wallichiana</i>	Bhutan Pinus	Pinaceae	✓	✓	✓	✓	✓	✓	✓	LC
8	<i>Plumeria obtusa</i>	Temple tree	Apocynaceae	✓	X	X	✓	X	✓	✓	LC
9	<i>Polyalthia longifolia</i>	Ashok	Annonaceae	✓	✓	✓	X	✓	✓	✓	LC
10	<i>Prunus domestica</i>	Plum	Rosaceae	✓	✓	X	✓	✓	✓	X	DD
11	<i>Robinia pseudoacacia</i>	Robinia	Fabaceae	✓	✓	✓	✓	✓	X	✓	NE
12	<i>Terminalia arjuna</i>	Arjun	Combretaceae	✓	✓	X	X	✓	✓	✓	NE
13	<i>Thuja occidentalis</i>	Saroo	Cupressaceae	✓	✓	✓	✓	✓	X	✓	LC
14	<i>Ziziphus jujuba</i>	Jujube	Rhamnaceae	✓	✓	✓	✓	✓	✓	✓	LC
SHRUBS											
1	<i>Asparagus falcatius</i>	Asparagus	Liliaceae	X	✓	✓	✓	X	✓	✓	NE
2	<i>Callicarpa reavessi</i>	Callicarpa	Verbenaceae	✓	✓	X	✓	X	✓	X	NE
3	<i>Duranta repens</i>	Pigeon berry	Verbenaceae	✓	X	✓	X	✓	✓	✓	NE
4	<i>Hamelia patens</i>	Firebush	Rubiaceae	✓	✓	✓	✓	X	✓	✓	NE
5	<i>Hibiscus rosa sinensis</i>	Chinese rose	Malvaceae	✓	X	✓	✓	✓	✓	✓	NE
6	<i>Lantana camara*</i>	Lantana	Verbenaceae	✓	✓	✓	✓	✓	✓	X	NE
7	<i>Lawsonia inermis</i>	Heena	Lythraceae	X	X	X	✓	X	✓	✓	NE
8	<i>Manihot esculenta</i>	Cassava	Euphorbiaceae	✓	✓	✓	✓	✓	✓	✓	NE
9	<i>Ziziphus nummularia</i>	Lotebush	Rhamnaceae	✓	✓	✓	✓	✓	✓	✓	NE
HERBS											
1	<i>Acanthus angustifolius</i>	Acanthus	Acanthaceae	X	✓	X	✓	X	✓	X	NE
2	<i>Agave americana</i>	Century plant	Asparagaceae	✓	✓	✓	X	X	✓	✓	LC
3	<i>Boerhavia diffusa</i>	Four o'clock	Nyctaginaceae	✓	X	✓	✓	✓	✓	✓	NE
4	<i>Calotropis procera</i>	Apple of sodom	Apocynaceae	✓	✓	X	✓	✓	✓	X	NE
5	<i>Cannabis sativa</i>	Bhang	Canabaceae	X	X	✓	✓	✓	✓	✓	NE
6	<i>Canna indica</i>	Edible canna	Cannaceae	✓	✓	✓	X	X	✓	✓	NE
7	<i>Croton bonplandianum</i>	Ban tulsi	Euphorbiaceae	✓	✓	✓	✓	X	✓	✓	NE
8	<i>Datura metel</i>	Datura	Solanaceae	X	✓	✓	✓	✓	✓	✓	NE
9	<i>Parthenium hysterophorus*</i>	Gajar boti	Asteraceae	✓	X	X	X	X	✓	X	NE

Sr. No	Scientific Names	Common Names	Families	Districts								DAFOR Scale	IUCN Red List Status	
				Bunier	Chitral	Dir Lower	Dir Upper	Malakand	Shangla	Swat				
10	<i>Verbascum thapsus</i>	Jackal tobacco	Scrophulariaceae	✓	✓	✓	✓	✓	✓	✓	✓	✓	F	NE
11	<i>Xanthium strumarium</i>	Rough cocklebur	Solanaceae	✓	✓	X	✓	✓	✓	✓	✓	✓	R	NE
GRASSES														
1	<i>Dichanthium annulatum</i>	Kleberg's bluestem	Poaceae	✓	✓	X	✓	✓	✓	✓	✓	✓	O	NE
2	<i>Eleusine indica</i>	Crow's feet	Poaceae	✓	✓	✓	X	✓	✓	✓	✓	✓	F	LC
3	<i>Eragrostis minor</i>	Lovegrass	Poaceae	✓	✓	✓	✓	X	✓	✓	✓	✓	F	NE
4	<i>Paspalum dilatatum</i>	Dallas grass	Poaceae	✓	✓	X	✓	✓	✓	✓	✓	✓	F	NE
5	<i>Phalaris minor</i>	Canary grass	Poaceae	✓	✓	✓	✓	✓	✓	✓	✓	✓	O	NE
6	<i>Poa annua</i>	Poa grass	Poaceae	✓	X	✓	✓	✓	✓	✓	✓	✓	O	LC
SEDGES														
1	<i>Carex fedia</i>	Carex	Cyperaceae	✓	✓	✓	X	✓	✓	✓	✓	✓	F	NE
2	<i>Cyperus compressus</i>	Annual sedge	Cyperaceae	X	✓	✓	✓	✓	✓	✓	✓	✓	O	LC
3	<i>Cyperus niveus</i>	Snow white	Cyperaceae	✓	X	X	✓	X	✓	✓	✓	✓	A	LC
4	<i>Cyperus rotundus</i>	Nut sedge	Cyperaceae	X	✓	✓	✓	✓	✓	✓	✓	✓	D	LC
5	<i>Kyllinga monocephala</i>	Kyllinga	Cyperaceae	✓	✓	✓	X	✓	✓	X	✓	✓	F	LC
PTERIDOPHYTA														
1	<i>Marsilea minuta</i>	Marsilea	Marsileaceae	✓	✓	X	✓	✓	✓	✓	✓	✓	F	LC
2	<i>Marsilea quadrifolia</i>	Marsilea	Marsileaceae	X	✓	✓	✓	✓	✓	X	✓	✓	O	LC
3	<i>Adiantum capillus-veneris</i>	Maiden hair Fern	Pteridaceae	✓	X	✓	X	✓	✓	✓	✓	✓	F	LC
4	<i>Pteris vittata</i>	Pteris	Pteridaceae	✓	✓	✓	✓	✓	✓	✓	✓	✓	O	NE


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A. *Eriobotrya japonica*



B. *Cannabis sativa*



C. *Juglans regia*



D. *Pinus roxburghii*



E. *Pinus wallichiana*



F. *Olea europaea*

Figure 4-16: Flora of Malakand Division

155. Observed species on these roads are: CHR-9 (6 trees, 8 shrubs, 5 herbs, 2 grasses, 2 sedges, 1 Pteridophytes) and CHR-10 (8 trees, 7 shrubs, 6 herbs, 2 grasses, 1 sedge, 2 pteridophytes), (table 4.8, figure 4-15).

Table 4-13: Flora of Peshawar Division

Sr. No.	Scientific Names	Common Names	Families	District Charsada		DAF or Scale	IUCN Red List Status
				✓			
TREES							
1	<i>Ailanthus altissima</i>	Ailanthus	Simarubaceae	✓		F	NE
2	<i>Ailanthus excelsa</i>	Heaven tree	Simarubaceae	✓		O	NE
3	<i>Albizia procera</i>	Siris white	Fabaceae	✓		F	LC
4	<i>Eucalyptus sp.</i>	Eucalyptus	Myrtaceae	✓		F	NE
5	<i>Morus nigra</i>	Mulberry black	Moraceae	✓		A	NE
6	<i>Olea europaea</i>	Wild olive tree	Oleaceae	✓		F	NE
7	<i>Polyalthia longifolia</i>	Ashok	Annonaceae	X		F	LC
8	<i>Populus deltoides</i>	Poplar	Salicaceae	✓		F	LC
9	<i>Punica granatum</i>	Pomigranate	Punicaceae	✓		A	LC
10	<i>Robinia pseudoacacia</i>	Robinia	Fabaceae	✓		O	LC
11	<i>Terminalia arjuna</i>	Arjun	Combretaceae	✓		O	LC
SHRUBS							
1	<i>Asparagus falcatus</i>	Asparagus	Liliaceae	✓		F	NE
2	<i>Duranta repens</i>	Pigeon berry	Verbenaceae	X		O	NE
3	<i>Hamelia patens</i>	Firebush	Rubiaceae	X		O	LC
4	<i>Hibiscus rosa sinensis</i>	Chinese rose	Malvaceae	X		F	NE
5	<i>Lantana camara*</i>	Lantana	Verbenaceae	X		F	NE
6	<i>Lawsonia inermis</i>	Heena	Lythraceae	X		O	LC
7	<i>Manihot esculenta</i>	Cassava	Euphorbiaceae	✓		O	NE
8	<i>Ziziphus nummularia</i>	Lotebush	Rhamnaceae	✓		O	NE
HERBS							
1	<i>Achyranthes aspera</i>	Devil's horsewhip	Amaranthaceae	X		O	NE
2	<i>Calotropis procera</i>	Apple of sodom	Apocynaceae	X		A	NE
3	<i>Cannabis sativa</i>	Bhang	Canabaceae	X		A	NE
4	<i>Convolvulus arvensis</i>	Convolvulus	Convolvulaceae	X		O	NE
5	<i>Conyza ambigua</i>	Butterweed	Asteraceae	X		A	NE
6	<i>Conyza canadensis</i>	Fleabane	Asteraceae	X		F	NE
7	<i>Oxalis corniculata</i>	Oxalis	Oxalidaceae	✓		O	NE
8	<i>Parthenium hysterophorus*</i>	Gajar boti	Asteraceae	✓		F	NE

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Sr. No.	Scientific Names	Common Names	Families	District Charsada		DAF or Scale	IUCN Red List Status
9	<i>Verbascum thapsus</i>	Jackal tobacco	Scrophulariaceae	X		A	NE
10	<i>Xanthium strumarium</i>	Rough cocklebur	Solanaceae	✓		F	NE
GRASSES							
1	<i>Dichanthium annulatum</i>	Kleberg's bluestem	Poaceae	✓		O	NE
2	<i>Eleusine indica</i>	Crows feet	Poaceae	✓		F	LC
3	<i>Eragrostis minor</i>	Lovegrass	Poaceae	X		F	NE
4	<i>Paspalum dilatatum</i>	Dallas grass	Poaceae	X		F	NE
5	<i>Phalaris minor</i>	Canary grass	Poaceae	X		O	NE
6	<i>Poa annua</i>	Poa grass	Poaceae	✓		O	LC
SEDGES							
1	<i>Carex fedia</i>	Carex	Cyperaceae	X		F	NE
2	<i>Cyperus rotundus</i>	Nut sedge	Cyperaceae	✓		D	LC
3	<i>Kyllinga monocephala</i>	Kyllinga	Cyperaceae	✓		F	LC
PTERIDOPHYTA							
1	<i>Marsilea minuta</i>	Marselia	Marsileaceae	X		F	LC
2	<i>Marsilea quadrifolia</i>	Marselia	Marsileaceae	X		O	LC
3	<i>Adiantum capillus-veneris</i>	Maiden hair Fern	Pteridaceae	✓		F	LC

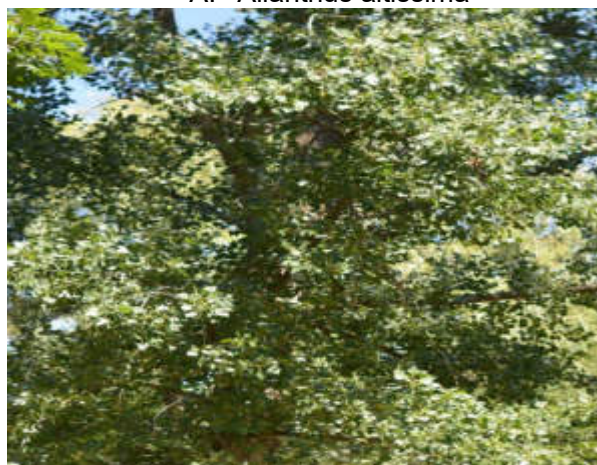

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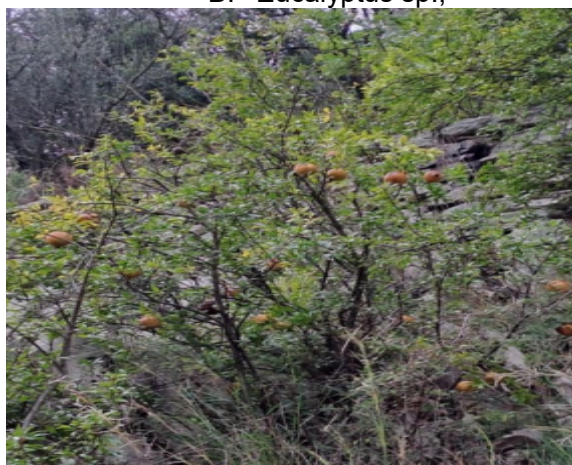
A. *Ailanthus altissima*



B. *Eucalyptus* sp.,



C. *Populus deltoides*



D. *Punica granatum*

Figure 4-17: Flora of Peshawar Division

156. Kohat comprises two roads: N-KOHT-2 and KOHT-3. The observed tree species counts were 4 for KOHT-1 and 8 for N-KOHT-2. Shrubs counts were 2 for KOHT-1 and 4 for N-KOHT-2. Regarding herbs, there were 2 species observed on KOHT-1 and 3 species on N-KOHT-2. Grass counts were 2 for KOHT-1 and 4 for N-KOHT-2. Sedge and Pteridophyte counts on the roads were observed as 2 and 1 for KOHT-1, and 3 and 2 for N-KOHT-2, respectively (table 4.9, figure 4-16).
157. Karak comprises only one road, N-KRK-R2. The total observed floral diversity around the road consisted of 6 tree species, 6 shrub species, 8 herb species, 5 grass species, 3 sedge species, and 3 Pteridophytes species.

Table 4-14: Flora of Kohat and Karak Subprojects

Sr. No	Scientific Names	Common Names	Families	Districts		DAFor Scale	IUCN Red List Status
				Kohat	Karak		
TREES							
1	Achyranthes aspera	Devil's horsewhip	Amaranthaceae	X	✓	F	NE
2	Bombax malabaricum	Cotton silk tree	Bombacaceae	✓	X	F	LC
3	Citrus Limon	Lemon	Rutaceae	✓	✓	F	NE
4	Eucalyptus sp.	Eucalyptus	Myrtaceae	X	X	F	LC
5	Pinus roxburghii	Pinus	Pinaceae	X	✓	F	LC
6	Plumeria obtusa	Temple tree	Apocynaceae	X	X	F	LC
7	Polyalthia longifolia	Ashok	Annonaceae	X	X	A	LC
8	Robinia pseudoacacia	Robinia	Fabaceae	X	X	F	NE
9	Terminalia arjuna	Arjun	Combretaceae	✓	✓	O	NE
10	Thuja occidentalis	Saroo	Cupressaceae	X	X	F	LC
11	Ziziphus jujuba	Jujube	Rhamnaceae	✓	X	F	LC
SHRUBS							
1	Asparagus falcatus	Asparagus	Liliaceae	X	✓	F	NE
2	Duranta repens	Pigeon berry	Verbenaceae	✓	✓	O	NE
3	Hamelia patens	Firebush	Rubiaceae	✓	X	O	LC
4	Hibiscus rosa sinensis	Chinese rose	Malvaceae	X	X	F	NE
5	Lantana camara*	Lantana	Verbenaceae	X	✓	F	NE
6	Lawsonia inermis	Heena	Lythraceae	X	✓	O	LC
7	Manihot esculenta	Cassava	Euphorbiaceae	X	✓	O	NE
8	Ziziphus nummularia	Lotebush	Rhamnaceae	X	✓	O	NE
HERBS							
1	Achyranthes aspera	Devil's horsewhip	Amaranthaceae	✓	✓	O	NE
2	Calotropis procera	Apple of sodom	Apocynaceae	X	✓	A	NE
3	Cannabis sativa	Bhang	Canabaceae	✓	✓	A	NE

Sr. No	Scientific Names	Common Names	Families	Districts		DAFor Scale	IUCN Red List Status
				Kohat	Karak		
4	Convolvulus arvensis	Convolvulus	Convolvulaceae	✓	✓	O	NE
5	Conyza ambigua	Butterweed	Asteraceae	✓	✓	A	NE
6	Conyza canadensis	Fleabane	Asteraceae	X	✓	F	NE
7	Oxalis corniculata	Oxalis	Oxalidaceae	✓	✓	O	NE
8	Parthenium hysterophorus*	Gajar boti	Asteraceae	✓	X	F	NE
9	Verbascum thapsus	Jackal tobacco	Scrophulariaceae	✓	X	A	NE
10	Xanthium strumarium	Rough cocklebur	Solanaceae	X	✓	F	NE
GRASSES							
1	Dichanthium annulatum	Kleberg's bluestem	Poaceae	✓	✓	O	NE
2	Eleusine indica	Crows feet	Poaceae	✓	✓	F	LC
3	Eragrostis minor	Lovegrass	Poaceae	X	✓	F	NE
4	Paspalum dilatatum	Dallas grass	Poaceae	X	X	F	NE
5	Phalaris minor	Canary grass	Poaceae	X	✓	O	NE
6	Poa annua	Poa grass	Poaceae	X	✓	O	LC
SEDGES							
1	Carex fedia	Carex	Cyperaceae	✓	X	F	NE
2	Cyperus rotundus	Nut sedge	Cyperaceae	✓	✓	D	LC
3	Kyllinga monocephala	Kyllinga	Cyperaceae	✓	X	F	LC
PTERIDOPHYTA							
1	Marsilea minuta	Marselia	Marsileaceae	X	✓	F	LC
2	Marsilea quadrifolia	Marselia	Marsileaceae	✓	✓	O	LC
3	Adiantum capillus-veneris	Maiden hair Fern	Pteridaceae	✓	✓	F	LC

* = Invasive, ** = Exotic, *** = Rare, D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare X = Absent. IUCN Red List Status: EN = Endangered, NT = Near Threatened, VU = Vulnerable, LC = Least Concern, NE = Not Evaluated DD = Data Deficient

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A. *Pinus roxburghii*



B. *Bombax malabaricum*



C. *Polyalthia longifolia*




D. *Terminalia arjuna*

Figure 4-18: Flora of Kohat Division

158. This district located in thorn scrub forest region containing species of dry habitats. The district consists of four roads BN-3, BN-5, and N-BN-1, N-BN-11. The roads BN-3 and BN-5 have trees, shrubs, herbs, grasses, sedges and Pteridophytes 20, 17, 31, 20, 4 & 2 and 21, 13, 19, 18, 02 & 01 respectively. While the other roads N-BN-1 and N-BN-11 have trees, shrubs, herbs, grasses, sedges and Pteridophytes 24 and 20, 16 and 18, 26 and 30, 15 and 22, and 3 and 2, respectively (table 4.10, figure 4-17).

Table 4-15: Flora of Bannu Subprojects

Sr. No.	Scientific Names	Common Names	Families	Districts		DAF or Scale	IUCN Red List Status
				Bannu			
TREES							
1	Acacia modesta	Small Acacia	Fabaceae	✓		A	NE
2	Conocarpus erectus**	Cono tree	Combretaceae	✓		O	LC
3	Dalbergia sissoo	Indian rosewood	Fabaceae	X		R	LC
4	Eucalyptus sp.	Eucalyptus	Myrtaceae	✓		O	LC
5	Ficus carica	Wild Fig	Moraceae	✓		F	LC
6	Leucaena leucocephala	Ippele iple	Fabaceae	✓		O	NE
7	Syzygium cumini	Black berry tree	Myrtaceae	X		F	LC
8	Ziziphus jujuba	Jujube	Rhamnaceae	X		O	LC
SHRUBS							
1	Abutilon indicum	Abutilon	Malvaceae	✓		O	NE
2	Alhagi maurorum	Alhagi	Fabaceae	✓		F	NE
3	Bougainvillea spectabilis	Bougainvillea	Nyctaginaceae	X		O	NE
4	Dodonaea viscosa	Sanatha	Sapindaceae	✓		F	LC
5	Nerium oleander	Kaner	Apocynaceae	✓		O	LC
6	Ricinus communis	Arind	Euphorbiaceae	✓		F	NE
7	Rosa indica	Rose	Rosaceae	✓		F	NE
8	Ziziphus nummularia	Lotebush	Rhamnaceae	✓		O	NE
HERBS							
1	Amaranthus viridis	Slender amaranth	Amaranthaceae	✓		O	NE
2	Atriplex vesicaria	Atriplex	Amaranthaceae	X		F	NE
3	Croton bonplandianum	Ban tulsi	Euphorbiaceae	X		F	NE
4	Euphorbia prostrata	Prostrate sandmat	Euphorbiaceae	X		O	NE
5	Ipomoea palmata	Ipomea	Convolvulaceae	X		F	NE
6	Jasminum humile	Pili chambeli	Oleaceae	X		R	NE
7	Jatropha integrima	Jatropha	Euphorbiaceae	✓		O	NE
8	Solanum xanthocarpum	Yellow berry	Solanaceae	✓		O	NE
9	Sonchus asper	Rough milk thistle	Asteraceae	X		O	NE
GRASSES							
1	Arundo donax	Giant reed	Poaceae	X		F	LC
2	Cenchrus biflorus	Cenchrus	Poaceae	X		R	NE


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Sr. No.	Scientific Names	Common Names	Families	Districts		DAF or Scale	IUCN Red List Status
				Bannu			
3	Cymbopogon Citratus	Lemon grass	Poaceae	✓		F	LC
4	Cynodon dactylon	Dub grass	Poaceae	✓		O	NE
5	Paspalum dilatatum	Dallas grass	Poaceae	✓		F	NE
6	Paspalum distichum	Paspalum	Poaceae	✓		O	LC
SEDGES							
1	Carex fedia	Carex	Cyperaceae	✓		F	NE
2	Cyperus compressus	Annual sedge	Cyperaceae	X		O	LC
3	Cyperus niveus	Snow white	Cyperaceae	✓		A	LC
4	Cyperus rotundus	Nut sedge	Cyperaceae	✓		D	LC
PTERIDOPHYTES							
1	Marsilea minuta	Marselia	Marsileaceae	✓		F	LC
2	Marsilea quadrifolia	Marselia	Marsileaceae	X		O	LC
3	Adiantum capillus-veneris	Maiden hair Fern	Pteridaceae	✓		F	LC

* = Invasive, **=Exotic, ***=Rare. D = Dominant, A= Abundant, F= Frequent, O = Occasional and R=Rare X= Absent. IUCN Red List Status: EN = Endangered, NT = Near Threatened, VU=Vulnerable, LC=Least Concern, NE=Not Evaluated DD= Data Deficient


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A. *Acacia modesta*



B. *Dalbergia sissoo*



C. *Leucaena leucocephala*



D. *Ziziphus jujuba*

Figure 4-19: Flora of Bannu Division

159. This district located in thorn scrub forest region containing species of dry habitats. The district consists of sixteen roads RRD-DIK-R1, RRD-DIK-R2, RRD-DIK-R4, RRD-DIK-R6, RRD-DIK-R7, RRD-DIK-NR4, RRD-DIK-NR5, RRD-DIK-NR6, RRD-DIK-NR7, RRD-DIK-NR8, RRD-DIK-NR9, RRD-DIK-NR10, KPR-DIK-NR11, RRD-DIK-NR12, KPR-DIK-NR13, and RRD-DIK-NR14. Roads have trees species 29, 29, 31, 30, 31, 31, 30, 26, 28, 29, 30, 29, 29, 28, 30, and 31 respectively. The shrubs on roads were 20, 19, 15, 20, 17, 14, 20, 18, 17, 15, 16, 19, 20, 17, 20 and 19, respectively. Regarding herbs on RRD-DIK-R1, RRD-DIK-R2, RRD-DIK-R4, RRD-DIK-R6, RRD-DIK-R7, RRD-DIK-NR4, RRD-DIK-NR5, RRD-DIK-NR6, RRD-DIK-NR7, RRD-DIK-NR8, RRD-DIK-NR9, RRD-DIK-NR10, KPR-DIK-NR11, RRD-DIK-NR12, KPR-DIK-NR13, and RRD-DIK-NR14 showed diversity of 21, 30, 27, 31, 32, 21, 20, 28, 29, 27, 21, 29, 30, 32, 31 and 35 species and grasses 18, 26, 21, 26, 24, 18, 27, 17, 15, 18, 27, 26, 22, 24, 17 and 26 respectively. Sedges and Pteridophytes on the roads observed 4, 1, 3, 2, 5, 4, 3, 3, 3, 4, 5, 3, 2, 2 & 3 and 1, 2, 2, 2, 3, 2, 1, 1, 1, 2, 3, 1, 3, 2 & 3 respectively.

4.4.5 Flora of the Proposed Project

160. While numerous districts in KPK are home to forested areas. The proposed road or bridges do not traverse through any forested areas in their surroundings.

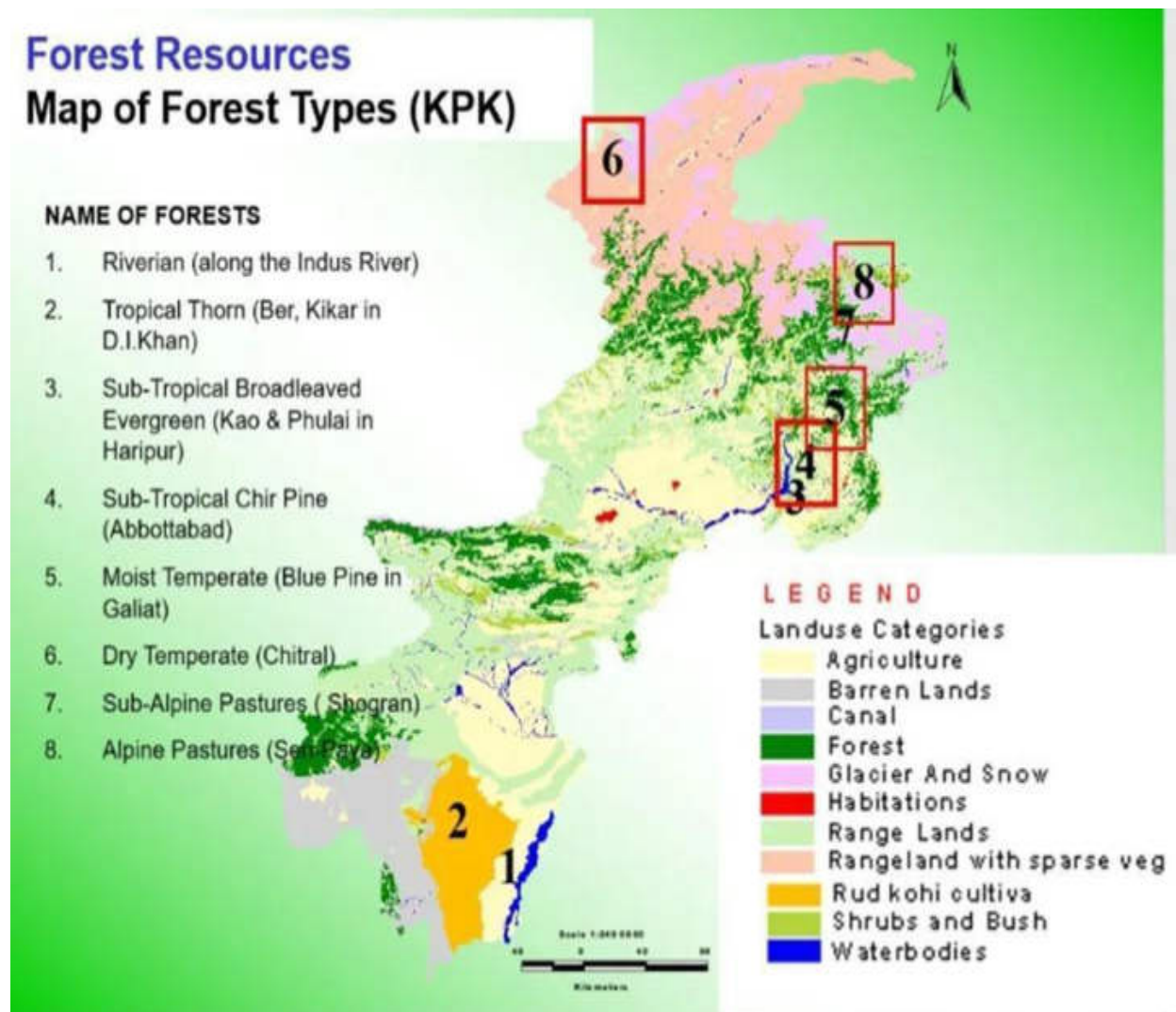


Figure 4-20: Location of Forests in KPK

4.4.6 Fauna

161. Ecological surveys were conducted for the study of fauna, which included the project area. Data collection, analysis and interpretations as well as findings are fully described below.

4.4.6.1 Fauna Sampling Methodology

162. Fauna sampling methodology includes mammal’s assessments, spoor tracking, scats survey, public survey and avifauna assessment, fish, reptile and amphibian assessment.

4.4.6.2 Mammal Assessment

163. A significant number of mammalian species are nocturnal, which means that they are predominantly active during the night and remain elusive during daytime, hence apart from direct sightings, indirect sampling methods were used. These methods compensate for the lack of night field surveys and enable detailed sampling without relying on direct observations and trappings. Mammal assessment was carried out using methods

described by Roberts (1997, 2005).⁸The survey was conducted by three surveyors from dawn till dusk for a period of three days.

4.4.6.3 Spoor tracking

164. Spoor tracking is an indirect survey method which uses observations such as footprint, burrows, den sites etc. to indicate the presence of a species. The method is simple, cost effective and comprehensive as it reduces dependency on direct sighting. However, the extent of details of a footprint and its preservation entirely depends on the suitability of soil.

4.4.6.4 Scats Survey

165. Another indirect method is the use of faecal matter to identify species. The morphometric analysis (size and shape) of the faecal matter allows identification of the taxonomic group. The method acts as a supplement to spoor tracking and an excellent measure of mammalian diversity and its abundance.

4.4.6.5 Public Survey

166. The local people at the survey sites interviewed regarding the species presence, abundance, and threats. Due to nocturnal habit and elusive nature, several mammalian species may go unreported if the survey solely relied on direct observations.

4.4.6.6 Avifauna Survey

167. The Avifauna survey was based on, line-transect, point count, general observation and call recognition. The survey was conducted from dawn till dusk the activity and detectability of the avifauna remained at optimal level. The birds were observed with binoculars (10 x 50) and identified with the help of acclaimed field guide by Grimmett. The point count method involved walking on a line transect and taking observations after a settling period of one minute.

4.4.6.7 Fish Assessment

168. Fishes collected from wetlands, streams (small rainy water channel) and ponds using local available gears and nets. Local area fisherman was also interviewed to collect data regarding fishes.

4.4.6.8 Reptile Assessment

169. Active search method adopted whereby debris, logs, wetlands and ponds searched for reptiles and amphibians for signs such as shed skin. Therefore, the survey primarily focused on search of indirect evidence through active searching. Some members directly observed during the survey.

170. Following table shows the fauna of various districts of KPK.

Table 4-16: Fauna of KPK

District	Mammals	Birds	Reptiles	Amphibians	Fish Species
Haripur	18	27	22	07	08
Mansehra	18	26	12	07	10
Kohistan	20	26	17	12	19
Torgarh	16	21	13	15	19
Bunner	12	74	17	14	04

⁸ <https://academic.oup.com/biohorizons/article/4/1/40/238741?login=false>



District	Mammals	Birds	Reptiles	Amphibians	Fish Species
Chitral	22	138	13	05	04
Dir Lower	22	57	14	14	38
Lower Dir	23	119	20	14	35
Malakand	16	21	13	15	19
Shangla	23	63	11	14	08
Swat	25	119	12	14	40
Charsadda	17	40	17	03	44
DI Khan	17	60	25	04	07
Karak	19	27	11	03	21
Kohat	16	23	11	03	19
Bannu	19	25	18	03	21

171. In Haripur total number of animals in the district were 18 mammals, 27 birds, 22 reptiles, 07 amphibians, and 08 fish species (table 4.12, figure 4-19).
172. In Mansehra total number of animals in the district were 18 mammals, 26 birds, 12 reptiles, 07 amphibians, and 10 fish species (table 4.12, figure 4-19).
173. In Kohistan total number of animals in the district were 20 mammals, 26 birds, 17 reptiles, 12 amphibians, and 19 fish species. In Torgarh total number of animals in the district were 16 mammals, 21 birds, 13 reptiles, 15 amphibians, and 19 fish species (table 4.12, figure 4-19).
174. In Bunner Total number of animals in the district were 12 mammals, 74 birds, 17 reptiles, 14 amphibians, and 04 fish species (table 4.13, figure 4-20).
175. In Chitral total number of animals in the district were 22 mammals, 138 birds, 13 reptiles, 05 amphibians, and 04 fish species. In Dir lower total number of animals in the district were 22 mammals, 57 birds, 14 reptiles, 14 amphibians, and 38 fish species. In Dir upper total number of animals in the district were 23 mammals, 119 birds, 20 reptiles, 14 amphibians, and 35 fish species. In Malakand total number of animals in the district were 16 mammals, 21 birds, 13 reptiles, 15 amphibians, and 19 fish species. In Shangla total number of animals in the district were 23 mammals, 63 birds, 11 reptiles, 14 amphibians, and 08 fish species. In Swat total number of animals in the district were 25 mammals, 119 birds, 12 reptiles, 14 amphibians, and 40 fish species (table 4.13, figure 4-20).
176. In Charsada Total number of animals in the district were 17 mammals, 40 birds, 17 reptiles, 03 amphibians, and 44 fish specie. In Nowshera total number of animals in the district were 16 mammals, 35 birds, 10 reptiles, 03 amphibians, and 31 fish species. In Peshawar total number of animals in the district were 24 mammals, 47 birds, 09 reptiles, 03 amphibians, and 16 fish species (table 4.14, figure 4-21).
177. In Mardan total number of animals in the district were 24 mammals, 56 birds, 14 reptiles, 03 amphibians, and 15 fish species. In Swabi total number of animals in the district were 22 mammals, 52 birds, 12 reptiles, 03 amphibians, and 13 fish species (table 4.15, figure 4-22).
178. In karak total number of animals in the district were 19 mammals, 27 birds, 11reptiles, 03 amphibians, and 21 fish species. In Kohat total number of animals in the district were 16 mammals, 23 birds, 11 reptiles, 03 amphibians, and 19 fish species (table 4.16, figure 4-23).

179. In D.I.Khan total number of animals in the district D.I. Khan were 17 mammals, 60 birds, 25 reptiles, 04 amphibians, and 07 fish species (table 4.17, figure 4-24)

Table 4-17: Fauna of Hazara Division

Sr. No.	Scientific Names	Common Names	Families	Districts				IUCN Red List Status
				Haripur	Kohistan	Mansehra	Torghar	
MAMMALS								
1	<i>Hystrix indica</i>	Indian crested porcupine	Hystricidae	√	x	√	x	LC
2	<i>Vulpes vulpes</i>	Red Fox	Canidae	√	x	√	x	LC
3	<i>Sus Scrofa</i>	Wild Boar	Moschidae	√	√	√	√	LC
4	<i>Canis familiaris</i>	Dog	Canidae	√	√	√	√	LC
5	<i>Corynorhinus townsendii</i>	Big-eared bat	Vespertilionidae	√	x	x	√	LC
6	<i>Felis chaus</i>	Jungle cat	Felidae	x	x	x	√	LC
7	<i>Funambulus palmarum</i>	Indian palm squirrel	Sciuridae	√	√	√	√	LC
8	<i>Herpestes edwardsi</i>	Grey Mongoose	Herpestidae	√	x	√	x	LC
9	<i>Lepus capensis</i>	Cap/wild hare	Leporidae	x	x	√	√	LC
10	<i>Dryomys nitedula</i>	Forest dormouse	Gliridae	√	√	√	x	LC
BIRDS								
1	<i>Acridotheres tristis</i>	Common Myna	Sturnidae	√	√	√	√	LC
2	<i>Alcedo atthis</i>	Common kingfisher	Alcedinidae	√	x	x	x	LC
3	<i>Passer domesticus</i>	House Sparrow	Passeridae	√	√	√	√	LC
4	<i>Pycnonotus cafer</i>	Red-vented bulbul	Pycnonotidae	√	√	√	√	LC
5	<i>Upupa epops</i>	Eurasian hoopoe	Upupidae	√	√	x	x	LC
6	<i>Bubulcus ibis</i>	Cattle egret	Ardeidae	√	x	√	x	LC

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Sr. No.	Scientific Names	Common Names	Families	Districts				IUCN Red List Status
				Haripur	Kohistan	Mansehra	Torghar	
7	Dendrocitta formosae	Grey treepie	Corvidae	x	x	x	x	LC
8	Dicrurus macrocerus	Black drongo	Dicruridae	x	x	√	x	LC
9	Vanellus indicus	Lapwing	Charadriidae	√	√	√	x	LC
REPTILES								
1	Hemidactylus frenatus	Common house gecko	Gekkonidae	√	√	√	√	LC
6	Urosaurus ornatus	Tree lizard	Phrynosomatidae	x	x	x	√	LC
14	Calotes versicolor	common garden lizard	Agamidae	√	√	√	√	LC
AMPHIBIANS								
1	Hoplobatrachus tigerinus	Indian Bull Frog	Dicroglossidae	x	x	√	√	LC
2	Euphyctis cyanophlyctis	Skittering Frog	Dicroglossidae	x	x	x	x	LC
3	Duttaphrynus melanostictus	Asian Toad	Bufoinae	√	√	x	√	LC
8	Duttaphrynus hazarensis	Hazara toad	Bufoinae	√	√	√	x	LC
FISHES								
1	Catla catla	Thaila(Catla)	Cyprinidae	√	√	x	x	LC
2	Labeo rohita	Rahu/Dambra	Cyprinidae	√	√	√	√	LC


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A. *Acridotheres tristis*



B. *Bubulcus ibis*



C. *Vanellus indicus*



D. *Passer domesticus*



E. *Sus Scrofa*



F. *Canis familiaris*

Figure 4-21: Fauna of Hazara Division

Table 4-18: Flora of Malakand Division

Sr. No.	Scientific Names	Common Names	Families	Districts						IUCN Red List Status	
				Bunner	Chitral	Lower Dir	Upper Dir	Malakand	Shangla		Swat
MAMMALS											
1	<i>Hystrix indica</i>	Indian crested porcupine	Hystricidae	✓	✓	✓	✓	✓	✓	×	LC
2	<i>Vulpes vulpes</i>	Red Fox	Canidae	✓	✓	✓	✓	✓	✓	✓	LC
3	<i>Bos taurus</i>	Cow	Bovidae	✓	✓	✓	✓	✓	✓	✓	LC
4	<i>Sus Scrofa</i>	Wild Boar	Moschidae	✓	✓	✓	✓	✓	✓	✓	LC
5	<i>Canis aureus</i>	Golden jackal	Canidae	×	✓	✓	✓	✓	✓	✓	LC
6	<i>Herpestes edwardsi</i>	Grey Mongoose	Herpestidae	×	✓	✓	×	✓	✓	×	LC
7	<i>Lepus capensis</i>	Cap/wild hare	Leporidae	×	✓	✓	×	×	✓	×	LC
8	<i>Dryomys nitedula</i>	Forest dormouse	Gliridae	×	✓	✓	×	×	×	✓	LC
BIRDS											
1	<i>Dicrurus macrocerus</i>	Black drongo	Dicruridae	✓	✓	✓	✓	×	✓	✓	LC
2	<i>Terpsiphone paradisi</i>	Indian paradise flycatcher	Monarchidae	×	✓	×	×	×	×	×	LC
3	<i>Apus apus</i>	Common swift	Apodidae	✓	✓	✓	✓	✓	✓	✓	LC
4	<i>Ardeola grayii</i>	Pond Heron	Ardeidae	×	✓	✓	✓	×	✓	✓	LC
5	<i>Alcedo atthis</i>	Common kingfisher	Alcedinidae	✓	✓	✓	✓	✓	✓	✓	LC
6	<i>Megaceryle lugubris</i>	Crested kingfisher	Alcedinidae	×	✓	×	✓	×	×	✓	LC
7	<i>Coracias garrulus</i>	European roller	Coraciidae	×	✓	×	✓	×	×	✓	LC
8	<i>Upupa epops</i>	Eurasian hoopoe	Upupidae	✓	✓	✓	✓	✓	✓	✓	LC
9	<i>Alectoris chukar</i>	Chukar	Phasianidae	×	✓	✓	✓	×	×	✓	LC
10	<i>Coturnix coturnix</i>	Common quail	Phasianidae	×	✓	✓	✓	×	✓	✓	LC

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Sr. No.	Scientific Names	Common Names	Families	Districts						IUCN Red List Status	
				Bunner	Chitral	Lower Dir	Upper Dir	Malakand	Shangla		Swat
REPTILES											
1	<i>Hemidactylus frenatus</i>	Common house gecko	Gekkonidae	√	√	√	√	√	√	√	LC
3	<i>Anguis fragilis</i>	Slow worm	Anguidae	√	√	√	√	√	√	√	LC
5	<i>Coluber spp.</i>	Coluber	Colubridae	x	√	√	x	x	x	x	LC
6	<i>Urosaurus ornatus</i>	Tree lizard	Phrynosomatidae	√	√	√	√	√	√	√	LC
AMPHIBIANS											
1	<i>Hoplobatrachus tigerinus</i>	Indian Bull Frog	Dicroglossidae	√	x	√	√	√	√	√	LC
2	<i>Euphyctis cyanophlyctis</i>	Skittering Frog	Dicroglossidae	x	x	√	√	√	√	√	LC
3	<i>Duttaphrynus melanostictus</i>	Asian Toad	Bufoinae	√	√	√	√	√	√	√	LC
4	<i>Bufo himalayanus</i>	Himalayan Toad	Bufoinae	x	x	x	√	√	√	x	LC
5	<i>Bufoetes pseudoraddei</i>	Green/swat toad	Bufoinae	x	x	√	x	√	√	√	LC
FISH											
1	<i>Cyprinus carpio</i>	Gulfam	Cyprinidae	x	√	√	√	√	√	√	LC
2	<i>Ompak pabda</i>	Singlai	Cyprinidae	x	√	√	√	√	√	√	DD
3	<i>Labeo rohita</i>	Rahu	Cyprinidae	√	√	√	√	√	√	√	LC


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Hystrix indica



Canis aureus



Ardeola grayii



Hoplobatrachus tigerinus



Coluber sp.



Labeo rohita

Figure 4-22: Fauna of Malakand Division

Table 4-19: Fauna of Peshawar Division

Sr. No.	Scientific Names	Common Names	Families	Districts		IUCN Red List Status
					Charsada	
MAMMALS						
1.	<i>Hystrix indica</i>	Porcupine	Hystriidae		x	LC
2.	<i>Funambulus pennantii</i>	Five-striped palm squirrel	Sciuridae		√	LC
3.	<i>Mus musculus</i>	House Mouse	Muridae		√	LC
4.	<i>Rattus rattus</i>	Black house rat	Muridae		√	LC
5.	<i>Rattus tanezumi</i>	Asian house rat	Muridae		√	LC
6.	<i>Suncus murinus</i>	House shrew	Soricidae		√	LC
7.	<i>Lepus nigricollis</i>	Wild rabbit	Leporidae		√	LC
8.	<i>Hipposideros fulvus</i>	Fulvus Leaf-nosed Bat	Vespertilionidae		√	LC
9.	<i>Pteropus giganteus</i>	Indian flying fox	Pteropodidae		√	LC
10.	<i>Hemiechinus collaris</i>	Long-eared desert hedgehog	Erinaceidae		x	LC
BIRDS						
1	<i>Acridotheres tristis</i>	Common Myna	Sturnidae		√	LC
2	<i>Spilopelia senegalensis</i>	Laughing Dove	Columbidae		x	LC
3	<i>Acridotheres ginginianus</i>	Bank Myna	Sturnidae		√	LC
4	<i>Alcedo atthis</i>	Common kingfisher	Alcedinidae		√	LC
5	<i>Coturnix coturnix</i>	Common Quail	Phasianidae		x	LC
6	<i>Halcyon smyrnenis</i>	White-throated kingfisher	Alcedinidae		√	LC
7	<i>Upupa epops</i>	Eurasian hoopoe	Upupidae		√	LC
8	<i>Egretta garzetta</i>	little egret	Ardeidae		√	LC
9	<i>Turdoides caudata</i>	Common babbler	Leiothrichidae		x	LC
10	<i>Apus affinis</i>	Common swift	Apodidae		√	LC

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Sr. No.	Scientific Names	Common Names	Families	Districts		IUCN Red List Status
				Charsada		
11	<i>Dendrocitta formosae</i>	Grey treepie	Corvidae	x		LC
REPTILES						
1	<i>Urosaurus ornatus</i>	Tree lizard	Phrynosomatidae	x		LC
2	<i>Varanus bengalensis</i>	Bengal monitor	Varanidae	√		LC
3	<i>Neja neja</i>	Cobra	Elapidae	x		LC
4	<i>Calotes versicolor</i>	common garden lizard	Agamidae	√		LC
AMPHIBIANS						
1	<i>Hoplobatrachus tigerinus</i>	Indian Bull Frog	Dicroglossidae	√		LC
2	<i>Euphyctis cyanophlyctis</i>	Skittering Frog	Dicroglossidae	x		LC
3	<i>Duttaphrynus melanostictus</i>	Asian Toad	Bufoinae	x		LC
FISH						
1	<i>Cyprinus carpio**</i>	Gulfam	Cyprinidae	√		LC
2	<i>Labeo rohita</i>	Rahu/Dambra	Cyprinidae	√		LC
3	<i>Glyptothenax stocki</i>	Catfish	Sisoridae	√		LC
4	<i>Channa punctatus</i>	Daula	Channidae	√		LC


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A. Bat (*Hipposideros fulvus*)



B. Indian Hare (*Lepus nigricollis*)



C. Quail (*Coturnix coturnix*)



D. Cobra (*Naja naja*)

Figure 4-23: Fauna of Peshawar Division

Table 4-20: Fauna of Mardan Division

Sr. No.	Scientific Names	Common Names	Families	Districts		IUCN Red List Status
					Mardan	
MAMMALS						
1	<i>Lepus nigricollis</i>	Cap/wild hare	Leporidae	✓		LC
2	<i>Mus musculus</i>	House mouse	Muridae	x		LC
3	<i>Rattus rattus</i>	Common rat	Muridae	✓		LC
4	<i>Sus Scrofa</i>	Wild Boar	Moschidae	✓		LC
5	<i>Canis familiaris</i>	Dog	Canidae	✓		LC
6	<i>Corynorhinus townsendii</i>	Big-eared bat	Vespertilionidae	✓		LC
7	<i>Dryomys nitedula</i>	Forest dormouse	Gliridae	✓		LC
8	<i>Macacca mulatta</i>	Monkey	Cercopithecidae	✓		LC
9	<i>Chiroptera</i>	Bat	Microchiroptera	✓		LC
10	<i>Pteropus giganteus</i>	Indian flying fox	Pteropodidae	✓		LC
BIRDS						
1	<i>Alcedo atthis</i>	Common kingfisher	Alcedinidae	✓		LC
2	<i>Egretta garzetta</i>	Little egret	Ardeidae	✓		LC
3	<i>Dendrocyitta vagabunda</i>	Rufous treepie	Corvidae	✓		LC
4	<i>Dicrurus macrocerus</i>	Black drongo	Dicruridae	✓		LC
5	<i>Argya huttoni</i>	Afghan babbler	Leiothrichidae	✓		LC
6	<i>Cinclus pallasi</i>	Brown dipper	Cinclidae	✓		LC
7	<i>Apus apus</i>	Common swift	Apodidae	✓		LC
8	<i>Vanellus indicus</i>	Red wattled lapwing	Charadriidae	✓		LC

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Sr. No.	Scientific Names	Common Names	Families	Districts		IUCN Red List Status
					Mardan	
9	<i>Coracias benghalensis</i>	Indian roller	Coraciidae	✓		LC
10	<i>Terpsiphone paradise</i>	Indian paradise flycatcher	Monarchidae	x		LC
REPTILES						
1	<i>Naja naja</i>	Cobra	Elapidae	✓		LC
2	<i>Calotes versicolor</i>	common garden lizard	Agamidae	✓		LC
AMPHIBIANS						
1	<i>Hoplobatrachus tigerinus</i>	Indian Bull Frog	Dicroglossidae	✓		LC
2	<i>Duttaphrynus melanostictus</i>	Asian Toad	Bufoidea	✓		LC
FISH						
1	<i>Catla catla</i>	Thaila (Catla)	Cyprinidae	✓		LC
2	<i>Cyprinus carpio</i> **	Gulfam	Cyprinidae	✓		LC
4	<i>Labeo rohita</i>	Rahu/Dambra	Cyprinidae	✓		LC
7	<i>Schizothorax plagiostomus</i>	Swati Fish	Cyprinidae	✓		DD

* = Invasive, **=Exotic, ***=Rare. D = Dominant, A= Abundant, F= Frequent, O = Occasional and R=Rare X= Absent. IUCN Red List Status: EX=Extinct, EW=Extinct in the wild, CR=Critically endangered, EN = Endangered, NT = Near Threatened, VU=Vulnerable, LC=Least Concern, NE=Not Evaluated DD= Data Deficient


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A. Rhesus Monkey (*Macacca mulatta*)



B. Kingfisher (*Alcedo atthis*)



C. Turtle Dove (*Streptopelia turtle*)



D. Asian toad (*Duttaphrynus melanostictus*)

Figure 4-24: Fauna of Mardan Division

Table 4-21: Fauna of Kohat Division

Sr. No.	Scientific Names	Common Names	Families	Karak	Kohat	IUCN Red List Status
MAMMALS						
1	<i>Oryctolagus cuniculus</i>	Rabbit	Leporidae	x	√	LC
2	<i>Hystrix indica</i>	Indian crested porcupine	Hystriidae	√	√	LC
3	<i>Pteropus giganteus</i>	Indian flying fox	Pteropodidae	√	√	LC
4	<i>Herpestes edwardsii</i>	Indian gray mongoose	Herpestidae	√	√	LC
5	<i>Felis chaus</i>	Jungle cat	Felidae	√	√	LC
6	<i>Paraechinus micropus</i>	Indian hedgehog	Erinaceidae	√	√	LC
7	<i>Hystrix indica</i>	Indian crested porcupine	Hystriidae	√	√	LC
8	<i>Lepus nigricollis</i>	Indian hare	Leporidae	√	√	LC
BIRDS						
1	<i>Francolinus pondicerianus</i>	Grey francolin	Phasianidea	√	x	LC
2	<i>Melanoperdix niger</i>	Black partridge	Phasianidea	x	x	LC
3	<i>Alectoris Chukar</i>	Chukar partridge	Phasianidea	x	√	LC
4	<i>Streptopelia capicola</i>	Ring necked Dove	Columbidae	x	√	LC
5	<i>Dicrurus macrocercus</i>	Black Drongo	Dicruridae	x	x	LC
6	<i>Pycnonotus leucotis</i>	White eared Bulbul	Pycnonotidae	√	√	LC
7	<i>Upupa epops</i>	Eurasian Hoopoe/hudhud	Upupidae	x	√	LC
8	<i>Sturnus vulgaris</i>	Common Starling	Sturnidae	√	√	LC
9	<i>Pavo cristatus</i>	Moor/peacock	Phasianidea	√	√	LC
10	<i>Meleagris gallopavo</i>	Wild Turkey	Phasianidea	√	√	LC
11	<i>Grus grus</i>	Common Crane	Gruidae	√	x	LC

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Sr. No.	Scientific Names	Common Names	Families	Karak	Kohat	IUCN Red List Status
REPTILES						
1	<i>Hemidactylus frenatus</i>	Common house gecko	Gekkonidae	√	√	LC
2	<i>Urosaurus ornatus</i>	Tree lizard	Phrynosomatidae	x	√	LC
3	<i>Varanus bengalensis</i>	Bengal monitor	Varanidae	x	x	LC
4	<i>Calotes versicolor</i>	common garden lizard	Agamidae	√	√	LC
5	<i>Chamaeleo zeylanicus</i>	Chameleon	Chamaeleonidae	x	√	LC
6	<i>Xantusia vigilis</i>	Desert lizard	Xantusiidae	x	√	LC
AMPHIBIANS						
1	<i>Rana tigrina</i>	Frog	Dicroglossidae	√	√	LC
2	<i>Euphlyctis cyanophlyctis</i>	Skittering Frog	Dicroglossidae	x	√	LC
3	<i>Duttaphrynus melanostictus</i>	Asian Toad	Bufonidae	x	√	LC
FISH						
1	<i>Labeo rohita</i>	Rohu	Cyprinidae	√	√	LC
7	<i>Catla catla</i>	Catla/thaila	Cyprinidae	√	√	LC
8	<i>Mastacembelus armatus</i>	Marmahi/Zig-zag eel	Mastacembelidae	x	√	LC


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A. Indian flying fox (*Pteropus giganteus*)



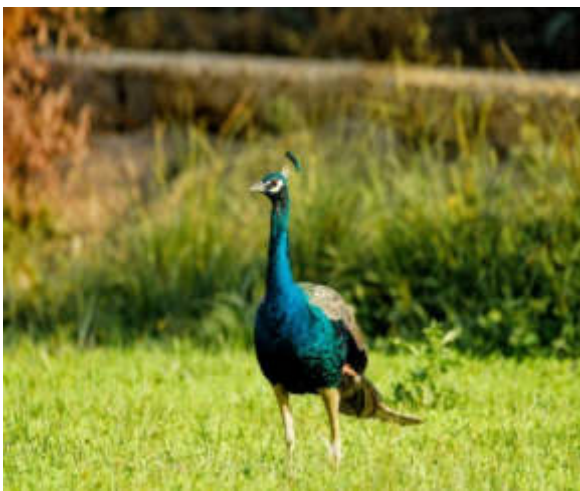
B. Jungle Cat (*Felis chaus*)



C. Indian hedgehog (*Paraechinus micropus*)



D. Grey Francolin (*Francolinus pondicerianus*)



E. Peacock (*Pavo cristatus*)



F. Common Crane (*Grus grus*)

Figure 4-25: Fauna of Kohat Division

Table 4-22: Fauna of Bannu Division

Sr. No.	Scientific Names	Common Names	Families	Districts		IUCN Red List Status
				Bannu		
MAMMALS						
1	<i>Hystrix indica</i>	Indian crested porcupine	Hystriidae	√		LC
2	<i>Vulpes cana</i>	Fox	Canidae	√		LC
3	<i>Hemiechinus auritus</i>	Hedgehog	Erinaceidae	√		LC
4	<i>Corynorhinus townsendii</i>	Big-eared bat	Vespertilionidae	x		LC
5	<i>Herpestes edwardsi</i>	Grey Mongoose	Herpestidae	x		LC
6	<i>Lepus nigricollis</i>	Cap/wild hare	Leporidae	x		LC
7	<i>Eutamias sibiricus</i>	common chipmunk	Sciuridae	√		LC
8	<i>Gazella bennettii</i>	Chinkara	Bovidae	√		LC
BIRDS						
1	<i>Acridotheres tristis</i>	Common Myna	Sturnidae	√		LC
2	<i>Coturnix coturnix</i>	Common Quail/Batair	Phasianidae	√		LC
3	<i>Halcyon smyrnensis</i>	White-throated kingfisher	Alcedinidae	x		LC
4	<i>Streptopelia decaocto</i>	Collared-Dove/Fanta	Columbidae	√		LC
5	<i>Milvus migrans</i>	Black kite	Accipitridae	√		LC
6	<i>Vanellus indicus</i>	Lapwing	Charadriidae	√		LC
7	<i>Pycnonotus cafer</i>	Red-vented bulbul	Pycnonotidae	√		LC
8	<i>Upupa epops</i>	Eurasian hoopoe/Hudhud	Upupidae	√		LC
REPTILES						
1	<i>Urosaurus ornatus</i>	Tree lizard	Phrynosomatidae	√		LC
2	<i>Naja naja</i>	Cobra	Elapidae	√		LC
3	<i>Calotes versicolor</i>	common garden lizard	Agamidae	√		LC

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Sr. No.	Scientific Names	Common Names	Families	Districts		IUCN Red List Status
				Bannu		
4	<i>Chamaeleo zeylanicus</i>	Chameleon	Chamaeleonidae	√		LC
AMPHIBIANS						
1	<i>Hoplobatrachus tigerinus</i>	Indian Bull Frog	Dicroglossidae	x		LC
2	<i>Rana tigrina</i>	Frog	Dicroglossidae	√		LC
3	<i>Duttaphrynus melanostictus</i>	Common Toad	Bufonidae	√		LC
FISH						
1	<i>Catla catla</i>	Thaila (Catla)	Cyprinidae	√		LC
2	<i>Cyprinus carpio**</i>	Gulfam	Cyprinidae	√		LC
3	<i>Labeo calbasu</i>	Kalbans/black rahu	Cyprinidae	√		LC
4	<i>Labeo rohita</i>	Rahu/Dambra	Cyprinidae	√		LC
5	<i>Puntius ticto</i>	Ticto barb	Cyprinidae	√		LC
IUCN Red List Status: EX=Extinct, EW=Extinct in the wild, CR=Critically endangered, EN = Endangered, NT = Near Threatened, VU=Vulnerable, LC=Least Concern, NE=Not Evaluated DD= Data Deficient						


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A. Indian Crested Porcupine (*Hystrix indica*)



B. Grey Mongoose (*Herpestes edwardsi*)



C. Red Wattled Lapwing (*Vanellus indicus*)



D. Cobra (*Naja naja*)

Figure 4-26: Fauna of Bannu Division

4.4.7 Special Status Species

180. The above-mentioned flora and fauna surveys have not identified any special status species (IUCN Red list species; Vulnerable (VU), Endangered (EN) or Critically Endangered (CR)). Further assessment of species in has been undertaken using the Integrated Biodiversity Assessment Tool (IBAT). Given the large geographical extent of the Project roads and bridges across KPK this assessment has focused on areas where sensitive habitats are most likely to be affected. All the roads will be upgraded within their RoW. Works will include simple resurfacing and drainage upgrades within the RoW (with some other slope protection works as necessary. Generally speaking, areas adjacent to road sides are not the preferred habitats of special status species such as White-rumped Vulture, Snow Leopards and Persian leopard, and as such this assessment has not focused on these species and areas with respect to biodiversity. However, some of the rivers where bridge works are planned have been identified as potentially important habitats for fish and turtles. Species potentially present include:

- Fish: *Glyptothorax kashmirensis* – CR, *Triplophysa kashmirensis* – CR, *Tor putitora* – EN, *Glyptothorax stocki* – EN, *Glyptothorax su I* – EN, *Paraschistura naseeri* – EN, *Schizothorax huegelii* – EN, *Schistura afasciata* – EN
 - Turtle: Indian Flapshell (*Lissemys Punctata*) Turtle – VU, Crowned River Turtle (*Hardella thurjii*) – EN, Indian Softshell Turtle (*Nilssonina Gangetica*) – EN, Indian Peacock Softshell Turtle (*Nilssonina hurum*) – EN, Indian Roofed Turtle (*Pangshura tecta*) – VU
 - Lizard: Yellow Monitor (*Varanus avescens*) – EN.
181. Turtles inhabit standing and slow-flowing waterbodies, though some are also encountered in flowing water. They bask on riverbanks, snags and vegetation. Yellow Monitor can also along riverbanks and is largely aquatic between June and October in the monsoon season. Accordingly, it is possible that all of these species could be found within perennial rivers over which the project bridges cross.

4.4.8 Nationally and Internationally Designated Sites

182. Mapping of the Project sites against nationally protected areas and international designated sites (Important Bird Areas (IBA) and Key Biodiversity Areas (KBA)). All of the roads and bridges screened are located away from these sites, with the exception of the following bridges and roads:

Table 4-23: Nationally and Internationally Designated Sites - Roads

#	Road ID	Road Length	District	Designated Site	Distance to Site
1	BN-5	5.3	Bannu	Sheikh Buddin Wildlife Sanctuary	Bordering
2	N-CHT-1	41.6	Chitral	Gehrait Gol Game Reserve	Adjacent
3	N-CHT-4	21.9	Chitral	Chitral Gol National Park	Adjacent
4	RRD-LKH-R1	10.3	Kohistan Lower	Pallas Valley KBA/IBA	Within the boundary
5	RRD-LKH-R2	10.0	Kohistan Lower	Pallas Valley KBA/IBA	Within the boundary
6	RRD-LKH-R4	13.8	Kohistan Lower	Kayal Valley KBA/IBA	Within the boundary

Table 4-24: Nationally and Internationally Designated Sites - Bridges

#	Bridge ID	Bridge Length	District	Designated Site	Distance to Site
1	KOH-BR-24	35m	Kohistan	Pallas Valley KBA/IBA	Less than 1km
2	MAN-BR-75	10m	Mansehra	Naran Reserved Forest to Saif-ul-Maluk lake KBA/IBA	Less than 1km
3	SNG-BR-80	90m	Shangla	Dubar Valley KBA/IBA	Less than 2km

183. Assessment details for the IBA/KBAs indicates that there are a range of bird species triggering IBA status, the most important of which in all sites is the Western Tragopan (*Tragopan melanocephalus*), IUCN – Vulnerable. Palas Valley is a key habitat for this species potentially comprising as much as 10% of global population.
184. The Pallas valley includes several sub-valleys having deep, steep sided valleys and precipitous slops, woodland and evergreen coniferous trees. The valley is spread at high

- altitudes from 1440masl to 2970 masl. One bridge of 35m and two roads i.e. RRD-LKH-R1, RRD-LKH-R2 are passing near the Pallas valley (although at lower altitude) which may cause the interference in the ecological life if not properly managed.
185. IUCN classify the Western Tragopan as a restricted range species. Accordingly, the threshold for Criterion 2 of IFCs critical habitat determination is triggered for the Palas Valley - Areas that regularly hold $\geq 10\%$ of the global population size AND ≥ 10 reproductive units of a species. Kayal Valley is not known to comprise such a significant population of the species and is not considered to represent potential critical habitat for this species.
 186. However, the Tragopan is generally found at elevations ranging between 1,750 and 3,600 meters above sea level (masl).
 187. Two other endangered species found in the Palas Valley are the Himalayan Musk Deer (*Moschus leucogaster*) and the Snow Leopard. The Musk Deer typically lives at elevations between 2,500 and 5,000 masl, preferring forested and alpine areas, while the Snow Leopard inhabits higher altitudes above 3000 masl.
 188. All three proposed roads within Palas Valley are located at elevations ranging from 630 masl up to 1,260 masl.

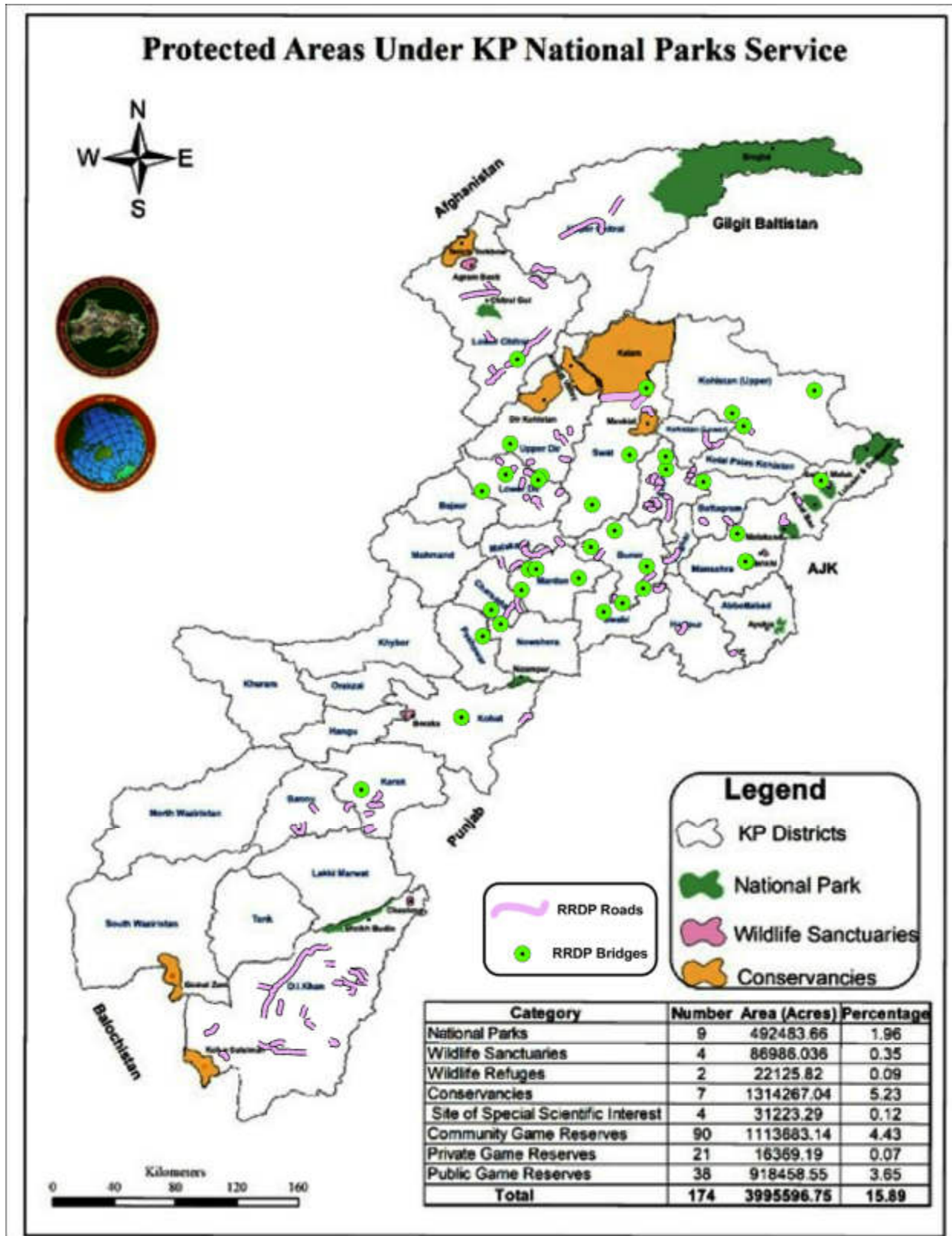


Figure 4-27: Projected areas Under KP National Park Service

4.5 Socio-economic Environment

4.5.1 Settlements along the Proposed Project

189. The proposed project involves the construction of roads and bridges spanning nineteen districts in KPK. This aims to enhance connectivity, ensuring efficient transportation and accessibility across diverse regions within the province.

Table 4-25: Settlement along the roads

Districts	Name of Settlements along the Proposed Roads
Shangla	Chakisar, Manga Kandao, Karindara, Martung, Saidabad, Alagarm, Chagam, Sookamar, Kalan, Banglai, Aloch, Baloo Bengalai, Chagam Gumbat, Alagram, Towa Chawkai Asharkot, Dehrai Kalay, Zara, Rahimabad, Tango Bassi, Shalmano Miankalay, Kandaw, Saif Abad, Kass, Sargay, and Kuza Alpurai.
Batagram	Kandar, Dokona, Kuzabanda, Char gali Feroz, Sokar Chilar, Abad Battamori and Shumali
Bunner	Sowari Mingora, Girari, Jowar Bunner, Anghapur, Jangdara Kalay, Torwarsak, Mali Kandao, Manga Thana, Jan Muhammad Kandao, Langaw Amazai, Nagarai.
Chitral	Drosh, Kalkatak, Ursoon, Shaghoor, Mogh, Garam Chashma, Grum, Mogh, Ruji, Arkari, Wamizd, Zundrangam, Shouch, Shahgroom Tirich, Muligram, Ujnu, Morich, Jinjerat Koh, Pret,
Dir	Sroo Gal, Daidan Pura, Lacha Maidan, Manzay Tangay, Bandgai, Sarbanda, Munjai Dir, Kumbar Maidan, Kuz Bagh, and Tangorai, Shorshing village, Badalai, Kwana, Razagay, Ghwago, Liati Bala, Shalfalam, Sultan Khel Abo, Lalo Bala, Luqman Banda, Utror, Thal,
Karak	Khadda Banda, Banda, Yaghi, Musakan Hamdan,
Malakand	Village Narrai Ubu, Koza Bazdara, Karimabad, Mura Banda Palai, Dargai, Ghareeb Abad, Peer Abad, Rahman Abad, Zahir Abad, Ikram Pur, Badraga, Kachi Kalay, Kulalan Kalay, Ghwar Kalay.
Torgarh	Madakhail, Palosa, Hassan Zai,
DI Khan	Parwara, Garah Khanwala, Kot Wali Dad, Sikandar Janubi, Jandi, Kot Musa, Hora Colony, Chandhwan,
Kohistan	Besham City, Batera, Shalkanabad, Barsharyal, Pattan Bazar, Mazo Kalai, Chilar, Dhar, and Yazai, Komila, Jalkot, Goshali, Pashot, and Dagan.
Swat	Kalam, Village Jamra, Shahu Village, Gul Bela, Boyun Village, Beshai Village
Haripur	Anar Gah, Akhora, Tial, Sarri, Basso Maira, Dheenda, and New Mumaia,
Swabi	Bori Beergali, Gasbani, Utla, and Akokri

4.5.2 Demography and Population

190. The total population of KPK in 2017 was 35.53 Million. Among them, 50.6% are male and 49.4% are female. The annual growth rate of the province is estimated as 2.4 % per year. The most populated districts among all the nineteen districts are Mardan and Peshawar having a population of 2,373,061 and 4,331,959, respectively.

4.5.3 Educational Facility and Literacy Rates

191. The literacy rate in Khyber Pakhtunkhwa (KPK) is around 53%, making it the third-literate province in Pakistan. A number of schools have been found along each proposed roads. The overall situation has been given in 4-19.

Table 4-26: Education in Subproject Area

Major Settlements	Primary Schools	Middle School	High School	Inter College
BN-3: Rehabilitation of Alla Khel to Havid Road in Bannu	1	1	0	0
BN-5: Rehabilitation of Durrani Chowk To Piran Titter Khel Road in Bannu	1	0	1	0
N-BN-1: Rehabilitation of Alla Khel to Mir Sher Khan Chowk via Havid Road in Bannu	1	1	0	0
N-BN-11: Reconstruction of Village Waligai Uc Zaraki Pirba Khel Road in Bannu	1	1	0	0
BTG-16: Rehabilitation of Rajdari to Kathora Road I/C Link Road in Battagram	1	3	2	1
BTG-2: Rehabilitation of road Kandari to Sokar Chilar in Battagram	1	1	0	0
N-BUN-2: Rehabilitation of Bababir to Manga Thana to Nagarai Road in Bunner	2	0	1	0
BUN-11: Rehabilitation of Jangdara Bato road in District Bunner	1	0	0	0
BUN-9: Rehabilitation of Girari road in Bunner	1	1	0	0
CHR-9: Rehabilitation of Takhtbhai Road to Malang Abad in Charsada	3	4	3	1
CHR-10: Rehabilitation of Road from Sardheri Bazar to Nisata via Zarin Abad in Charsada	2	3	2	1
N-CHT-2: Rehabilitation of Osaic to Orsoon road in District Chitral	1	1	0	0
DRL-35: Rehabilitation of Mula Hukam Baba to Sro Gul Khero Shah road in lower Dir.	1	0	1	0
T-30: Rehabilitation of road to Sar Banda Munjai Top in lower Dir	1	1	0	0
T-31: Rehabilitation of road to Pantolo Picnic Spot in lower Dir	1	1	0	0
N-KRK-R2: Rehabilitation of road from Takhte Nasrati Bridge to Khadda Banda via Bhogara Culvert Rose Baig Khail Kalah in District Karak	1	0	1	0
KOHAT-3: Rehabilitation of road from Mukarab Khan Korona to Kot Road in District Kohat	1	1	0	0
N-KOHAT-3: Rehabilitation of Khusal Garh Road to Kamar Dhoke in District Kohat	1	1	0	0
CHR-4: Rehabilitation of road from Landi Shah to Narrai Uba in Malakand.	1	3	2	2
MLK-7: Rehabilitation of road Neher Quarter to Jaban Power House in District Malakand	1	1	1	0
MLK-4: Rehabilitation of Mura Banda Link road in Malakand	2	0	1	0
N-MLK-1: Rehabilitation of Daragai-Palai Interchange Swat Motorway in District Malakand	1	0	0	0
N-MLK-2: Rehabilitation of road from Badranga to Jazoon Dag Road in District Malakand	3	1	1	1
SNG-14: Rehabilitation of road from Chakesar Nebi More to Said Abad in District Shangla	1	1	1	0
SNG-61: Rehabilitation of Miankalay Pagorai Kas Road in Shangla	1	1	0	0
SNG-20: Rehabilitation of Towa Chowkai Asharkot Road in Shangla	1	1	1	1

Major Settlements	Primary Schools	Middle School	High School	Inter College
SNG-26: Rehabilitation of Aluch Bunirwall Road in Shangla	1	0	1	0
SNG-28: Rehabilitation of Bengalai Landai Balo Chawak Road in Shangla	1	1	0	0
SNG-30: Rehabilitation of Dherai Faiza Sondvi Road in Shangla	1	1	0	0
SNG-27: Rehabilitation of Main Dara in District Shangla	1	3	2	2
SNG-29: Rehabilitation of Chagum Gumbat Road in District Shangla	1	1	0	1
SNG-63: Rehabilitation of Alpurai Barkas Kag Road in District Shangla	2	0	1	1
SNG-22: Rehabilitation of Chagam Alamay Road in District Shangla	1	0	0	1
SNG-7: Rehabilitation of Martung Chakisar Road in District Shangla	1	1	0	0
SNG-60: Rehabilitation of Rahimabad Kas Basi Road in District Shangla	1	1	1	1
SNG-33: Rehabilitation of Zara Road in District Shangla	1	1	0	0
TGH-1: Rehabilitation of Karrak Madakhel to Hasan Zai Road in District Tor Garh	1	1	0	0
T-1: Rehabilitation of Rani Ghat Road in District Bunner	1	0	1	0
N-CHT-9: Rehabilitation of Pashty Road, Pret to Pashty Valley in District Chitral	1	1	0	0
DRL-4: Rehabilitation of Ouch Kotigram Local Road in Dir Lower	1	1	0	0
T-3: Rehabilitation of Road to Laram Top in Dir Lower	1	3	2	1
T-42: Rehabilitation of Road to Sheen Ghar Top in Dir Upper	1	1	0	0
T-43: Rehabilitation of Road from in Uthror to Thal via Badgoi Top Dir Upper	2	0	1	1
T-35: Rehabilitation of Nara Akhoonkhail Waterfall Road in Haripur	3	2	2	2
T-7: Rehabilitation of Noori Water Fall Road in Haripur	1	1	0	0
HRI-17: Rehabilitation of Anar Gah Road in Haripur	1	1	1	1
MAN-2: Rehabilitation of Shingri Road in Mansehra	4	1	2	1
T-12: Rehabilitation of Road to Saiful Maluk Lake in Mansehra	1	1	0	0
T-22: Rehabilitation of Road to Sharan Forest in Mansehra	1	0	1	0
SWT-5: Rehabilitation of Kalam Banr Shahoo Road in Swat	1	1	0	0
T-19: Rehabilitation of Beshai Meadows Raod in Swat	3	1	1	0
T-4: Rehabilitation of Kandol Lake Paristan Lake in Swat	1	3	2	2
N-SWT-T-2: Rehabilitation of Taip Banda Road in Swat	1	1	0	0
T-2: Rehabilitation of Beer Gali Road in Swabi	2	0	1	0

Major Settlements	Primary Schools	Middle School	High School	Inter College
SWT-5: Rehabilitation of Kalam Banr Shahoo Road in Swat	1	0	0	0
T-19: Rehabilitation of Beshai Meadows Raod in Swat	1	1	0	0
T-4: Rehabilitation of Kandol Lake Paristan Lake in Swat	1	1	1	0
N-SWT-T-2: Rehabilitation of Taip Banda Road in Swat	1	1	0	0
N-SWT-T4: Rehabilitation of Road from Uthror to Thal via Badgoi Top in Swat.	1	1	0	0
N-SWT-T3: Rehabilitation of Raod from Desan Meadows to Kalam in Swat	1	0	1	0
RRD_UCH_NR1: Rehabilitation of Oveer road in Chitral	1	1	0	0
N-CHT-1: Rehabilitation of Shesha to Madalcasth road in Chitral	1	1	0	0
N-CHT-5: Rehabilitation of Arkari Valley road in Chitral	1	3	2	2
N-CHT-6: Rehabilitation of Tirch road from Nishko bridge to Shahgroom Tirch, Chitral	1	1	0	0
N-CHT-7: Rehabilitation of Rech road in Chitral	2	0	1	0
KPR_DIK_NR11: Rehabilitation of Main N-50 to Shero Kuhna road in D.I.khan	1	0	0	0
KPR_DIK_NR13: Main N-55 road to Diyal via Airport and CRBC Colony, D.I. khan	1	1	0	0
RRD_DIK_R1: Rehabilitation of Prova to Chowdwan road in D.I.khan	1	1	1	0
RRD_DIK_R2: Rehabilitation of Kulachi to Luni road in D.I.khan	1	1	0	0
RRD_DIK_R4: Rehabilitation of Mian Kasirai Shareef road (Darazinda) in D.I.khan	1	1	0	0
RRD_DIK_R6: Rehabilitation of Parwara jalal Khell road (Darazinda) in D.I.Khan	1	0	1	0
RRD_DIK_R7: Rehabilitation of Main Daraban road to Kot Walidad via Garah Khan	1	1	0	0
RRD_DIK_NR4: Rehabilitation of Indus highway to Dhok Rabnawaz and Chah Hussain road in D.I.khan	1	1	0	0
RRD_DIK_NR5: Rehabilitation of Chashma road, Thathal Adda to Phahar pur old Canal road Via Mubarak shah & Thatha in D.I.khan	1	3	2	2
RRD_DIK_NR6: Rehabilitation of road from Chashma road to village Musa khar and Jabbar wala in D.I.khan	1	1	0	0
RRD_DIK_NR7: Rehabilitation of Awan Nala Civil Minor road in D.I.khan	2	0	1	0
RRD_DIK_NR8: Rehabilitation of road from CRBC Canal to Diyal Paharpur Canal road & Rehmat Abad Link in D.I.khan road from	1	0	0	0
RRD_DIK_NR9: Rehabilitation of Pusha Pul to Garrah Rehman in D.I.khan	1	1	0	0
RRD_DIK_NR12: Rehabilitation of Jhandi Sewaag Road in D.I.khan	1	1	1	0

Major Settlements	Primary Schools	Middle School	High School	Inter College
RRD_DIK_NR10: Rehabilitation of Main N-55 road to Sadra Sharif Road in D.I.khan	1	1	0	0
RRD_DIK_NR14: Rehabilitation of Giloti Road in D.I.khan	1	1	0	0
RRD_DRU_R1: Link Roads Ushera Darra	1	0	1	0
RRD_DRU_NR3: Rehabilitation of Katigram to Shagai U/C Kotke	1	1	0	0
RRD_DRU_NR4: Rehabilitation of Sundrai to Qadarkandow Road (Nehag Darra)	1	1	0	0
KPR_KRK_NR5: Rehabilitation of Hamdan to Inzar More in Karak	1	3	2	2
RRD_KRK_R1: Rehabilitation of Indus Highway to Nari Khawar in Karak	1	1	0	0
RRD_KRK_R3: Rehabilitation of Payala More to Shahidan Banda in Karak	2	0	1	0
RRD_LKH_R1: Rehabilitation of Batera Road in Lower Kohistan	1	0	0	0
RRD_LKH_R2: Rehabilitation Pattan Ziarat Road (Seer Gazi Abad to Kharat) in Lower Kohistan	1	1	0	0
RRD_LKH_R1: Rehabilitation of Masham Road in Lower Kohistan	1	1	1	0
RRD_LKH_R4: Rehabilitation of Chawa Darra Road and Renolia Road Tehsil, Bunkat, Ronolia in Lower Kohistan	1	1	0	0
RRD_UKH_R1: Rehabilitation of Jalkot Goshali Road 1: Gabber Nullah Road in Upper Kohistan	1	1	0	0

Source; Baseline Social Survey

4.5.4 Health facilities

192. Along the proposed roads the health facilities are of basic levels, including basic health unit, some private practitioners, and a few hospitals with limited medical facilities. The Basic Health Unit Towa, Basic Health Unit Chagam, Chinix Pharmacy, Aloch, Shifa Medical Complex, RHU Hospital UC Gudikhell and Dr. Syed Wasimullah Medical Specialist – Clinic are located around the Towa Chowkai Asharkot Road (SNG-20), Chagam Alamay Road (SNG-22), Aluch Bunirwall Road (SNG-26), Bengalai Landai Balo Chawak Road (SNG-28), Payala More to Shahidan Banda Road (RRD-KRK-R3), and Indus Highway to Nari Khawar Road (RRD-KRK-R1) respectively. Some of the homeopathic units are also located such as the Martung Homeopathic Clinic and Javed Homeopathic Clinic are present in the vicinity of Martung Chakisar Road (SNG-7) and Nara Akhoonkhail Waterfall Road (T-35), respectively. The proposed road in District Kohistan has Pallas Health Care Center, RHU Hospital, and Basic Health Unit, Jalkot near the Pattan Ziarat Road (RRD-LKH-R2), Chawa Darra Road (RRD-LKH-R4), and Gabber Nullah Road (RRD-UKH-R1).

Table 4-27: Health Facilities

Road ID	Road Name	Health Facility	Distance for RoW	Google Coordinates
SNG-7	Martung Chakisar Road	Martung Homeopathic Clinic	900	34°40'48.71"N 72°44'49.21"E
SNG-20	Towa Chowkai Asharkot Road	Basic Health Unit Towa	321	34°47'42.56"N 72°40'57.24"E
SNG-22	Chagum Alamay Road	Basic Health Unit Chagum	350	34°45'52.39"N 72°39'26.72"E
SNG-26	Aluch Bunirwall Road	Clinix Pharmacy, Aloch	801	34°44'14.95"N 72°41'12.19"E
SNG-27	Main Dara Road	Basic Health Unit Chagum	223	34°45'52.22"N 72°39'26.79"E
SNG-28	Bengalai Landai Balo Chawak Road	Shifa Medical Complex Pura (SMC)	338	34°44'58.09"N 72°40'51.45"E
SNG-29	Chagum Gumbat Road	Basic Health Unit Chagum	310	34°45'52.33"N 72°39'26.78"E
RRD-KRK-R1	Indus Highway to Nari Khawar	Dr.Syed Wasimullah Medical Specialist - Clinic	328	33° 2'17.84"N 71° 2'3.57"E
RRD-KRK-R3	Payala More to Shahidan Banda	RHC Hospital UC Gudikhell	522	32°52'49.94"N 71° 1'38.81"E
CHT-2	Osaic To Orsoon Road	Tehsil Headquarter Hospital Drosch	366	35°33'17.03"N 71°47'39.58"E
KPR_DIK_NR_11	Main N-50 to Shero Kuhna Road	BHU Sheru Kohna	115	31°47'47.87"N 70°37'16.33"E
T-35	Nara Akhoon Khail Waterfall Road	Javed Homeopathic Clinic	414	34° 1'17.71"N 72°49'20.04"E
T-2	Beer Gali Road	Basic Health Unit Gabasni	205	34°16'1.30"N 72°42'29.10"E
MLK-7	Neher Quarter to Jaban Power House	BHU Kharkai (Basic Health Unit Kharkai)	1159	34°30'43.05"N 71°53'12.57"E
N-MLK-1	Daragai - Palai Interchange Swat Motorway	Pitaw-Pharmacy	300	34°28'43.33"N 71°56'8.12"E
N-MLK-2	Badraga to Jazoona Dag Road	Koper Malakand Hospital	1088	34°24'24.43"N 71°50'11.56"E
RRD-LKH-R1	Batera Road	Basic Health Unit Batera - Hospital	329	34°56'52.52"N 72°53'5.36"E
RRD-LKH-R2	Pattan Ziarat Road	Pallas Health Care Center - Hospital	309	35° 6'9.45"N 73° 0'0.31"E
RRD-LKH-R4	Chawa Darra Road and Renolia Road Tehsil	RHC - Hospital	442	35° 6'33.12"N 73° 0'24.66"E
RRD-UKH-R1	Gabber Nullah Road	BHU Jalkot	372	35°14'49.71"N 73°12'44.62"E
T-31	Pantolo Picnic Spot Road	Bishgram Hospital	962	34°58'49.04"N 71°50'18.37"E
		Malik Pharmacy & First Aid Center	231	34°57'52.99"N 71°50'26.11"E

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Provincial Road Improvement Project
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Road ID	Road Name	Health Facility	Distance for RoW	Google Coordinates
DRL-35	Mula Hukam Baba to Sro Gul Khero Shah Road	Zimdera Police station - Hospital	212	35°0'51.05"N 71°47'17.75"E
RRD-DRU-R1	Usherai Dara Link Roads (Link-A)	Ali Gasar Medical Center - General hospital	235	35°10'46.83"N 72° 6'12.76"E

Source: Baseline Social Survey



Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

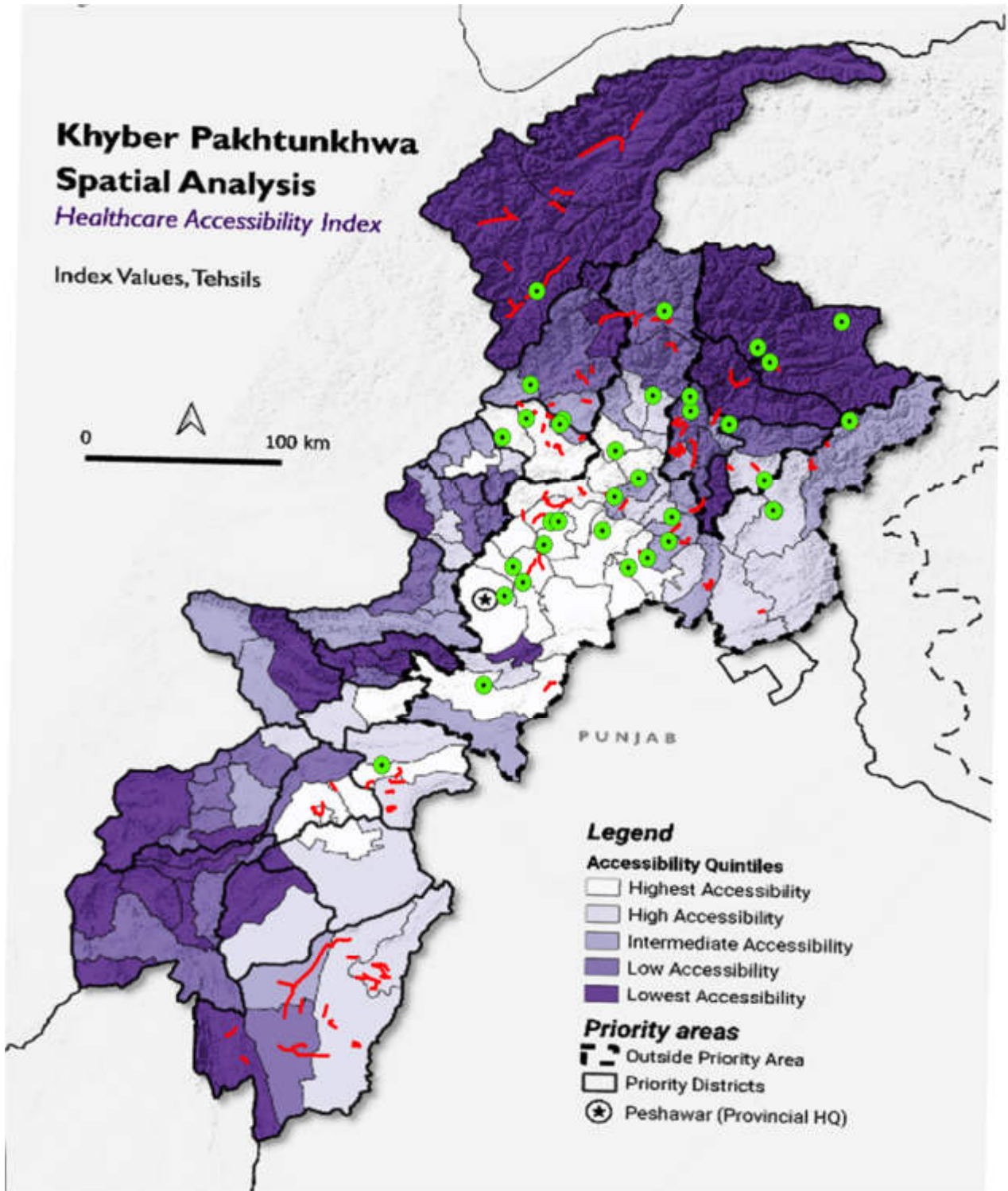


Figure 4-28: Health Accessibility Index of Project Areas

4.5.5 Major Crops and Source of Income

193. Swat, Mansehra, D.I Khan, Mardan, Charsadda, Swabi, Peshawar, and Buner are the primary agricultural districts in KPK where rehabilitation work is proposed.

Table 4-28: Crops of the Project Districts

District	Major Crops
Swat	Apples, Apricots, Plums, Maize, Vegetables
Mansehra	Maize, Wheat, Barley, Potatoes, Fruits (apples, peaches)
D.I Khan	Wheat, Sugarcane, Cotton, Maize, Vegetables
Mardan	Sugarcane, Tobacco, Wheat, Maize, Vegetables
Charsadda	Sugarcane, Tobacco, Wheat, Maize, Vegetables
Swabi	Wheat, Sugarcane, Tobacco, Maize, Vegetables
Peshawar	Wheat, Maize, Sugarcane, Fruits (oranges, grapes), Vegetables
Bunner	Maize, Wheat, Barley, Potatoes, Fruits (apples, apricots)

4.5.6 Languages

194. Pashto is the most widely spoken language in KPK.

Table 4-29: languages of the project districts

District	Language	District	Language
Bannu	Pashto (Waziri and Dawari dialects), Saraiki	Charsadda	Pashto (Yousafzai dialect), Hindko
Batagram	Kohistani, Pashto	Dir	Pashto (Dirwali dialect), Khowar
Bunner	Pashto (Swati dialect), Hindko	Karak	Pashto (Bannu dialect), Pashto (Orakzai dialect)
Kohat	Pashto (Bangash dialect), Pashto (Hangu dialect)	Kohistan	Kohistani (various dialects), Pashto
Mansehra	Pashto (Hazara dialect), Hindko, Gojri	Chitral	Khowar, Kalasha, Bashgali
Mardan	Pashto (Yousafzai dialect), Hindko	Nowshera	Pashto (Yousafzai dialect), Hindko
Peshawar	Pashto (Yousafzai dialect), Hindko	Shangla	Pashto (Swati dialect), Kalasha
Haripur	Hindko, Pashto (Hazara dialect)	Swabi	Pashto (Yousafzai dialect), Hindko
DI Khan	Pashto (Bannu dialect), Saraiki	Swat	Pashto (Swati dialect), Kohistani
Torgarh	Pashto (Swati dialect)		

4.5.7 Tribes

195. The districts in Khyber Pakhtunkhwa have various tribes, each with unique traditions and histories. The Pashtuns, a prominent ethnic group, dominate the region with tribes like Afridi, Khattak, Yousafzai, and Wazir. The Hindko-speaking community in areas like Haripur and Mansehra boasts its distinct cultural heritage. The Gujjar tribe, scattered across these districts, is recognized for its pastoral lifestyle and expertise in cattle-rearing. Inhabiting regions like Kohistan and Torgarh, the Kohistani people have a distinct culture

and language. The Chitral district is home to the Kalash tribe, renowned for ancient pagan traditions and vibrant festivals.

4.5.8 Religions

196. Over 99% of the population in KPK is Muslim. Other religious groups in KPK include Hindus, Christians, Sikhs, Ahmadis, and others.

4.5.9 Living

197. Culture is considered an agent for social and behavioral changes and a dynamic for the development of indigenous wisdom and creativity. It is the only tool through which we can bring harmony in the collective thoughts of the people of the society, as Art and Culture can block the entrance of the destructive activities and pave way for the innovation and peace. Nature has gifted this region with a rich cultural potential, owing to its geographical set up, Climate, natural and cultural resources. It has been a confluence of different civilizations which flourished and vanished with the passage of time. Since that time the continuation of cultural practices and the interaction and co-existence of various races have given birth to a unique life style that can be traced in their thousands years old folklore. The life style of the people of Khyber Pakhtunkhwa has a long history contributed by various ethnic groups in thousands of years through human experiences. It has a unique characteristic due to a variety of diversified Cultures. Thus, it was the need of the day to safeguard and preserve the indigenous cultures of the region, explore diverse cultural manifestations through all possible ways and means and to show the real face of the province to the world through this very significant way, so as to provide not only a sense of pride to the people of the region on their unparalleled life style but could pave the way for peace, innovations and creativity.
198. Khyber Pakhtunkhwa is inhabited mainly by the Pashtun, who are noted for their independence. The Pashtun comprise many tribes and clans, each taking great pride in its genealogy. Pashto is the main language in the province, except for some areas where Punjabi predominates, and virtually all of the population is Muslim. Only a small part of the overall population is urban. The province's major cities include Peshawar, Mardan, Mingaora, Kohat, and Abbottabad.

4.5.10 Source of water

199. Water is the basic need for the life. In hilly areas such as Chitral, Dir, Swat, Malakand the natural streams and canal/Chashma water is main source of the water. In south region the underground is also main water source.

4.5.11 Electricity and Gas

200. Peshawar Electric Supply Company (PESCO) serves as the primary electricity provider in the Khyber Pakhtunkhwa (KPK) province. While, (Sui Northern Gas Pipelines Limited) SNGPL is the main provider of Gas in KPK.

4.6 Agriculture & Livestock

201. Khyber Pakhtunkhwa dominates the economy in forestry and agriculture by generating heavy revenue. The contribution of the Khyber Pakhtunkhwa in the agriculture sector is indispensable. It took decades of consistent efforts to inculcate organized service and successful implementation to reach the desired expectations. To sustain a recognized position in agriculture industry, the Khyber Pakhtunkhwa agriculture department has

consistently worked beyond the expert assistance in the improvement of the production but to develop new technologies through research, assistance to the farm people to improve farming methods and techniques through educational procedures, increasing production efficiency and income, bettering their levels of living, and lifting the social and educational standards of rural life.

202. The province's economy is essentially agricultural, even though the mountainous terrain is not favorable to extensive cultivation. Irrigation is carried out on about one-third of the cultivated land. Wheat, corn (maize), sugarcane, and tobacco are the major crops. The principal industries are the manufacture and refining of sugar, the canning and preservation of fruits and vegetables, tobacco processing, and the manufacture of small arms and accessories. Other products are cotton textiles, cement, ghee (clarified butter), furniture, and milled grains.

4.7 Oil and Gas

203. The Oil and gas exploration and production sector has great potential for the investment. The Khyber Pakhtunkhwa government being cognizant of the investment opportunities, has developed the systems to cater and facilitate the foreign investors in Pakistan for convenience. To encounter the impediments faced by the foreign investors a special committee Energy Apex Committee (EAC) has formed. The purpose is to facilitate the investors to make the process transparent and unambiguous. The latest Petroleum Policy-2012, a one window facility offers tremendous incentives and thus provides high returns to investors as operators or non-operators.

4.8 Mines and Minerals

204. Khyber Pakhtunkhwa has the third-largest provincial economy in Pakistan. The province contributes 10% of Pakistan's GDP and 20% in mining output. Khyber Pakhtunkhwa outshines in mines and minerals industry by excelling in generating record breaking revenue. The province holds extensive opportunities in mines sector for the investors. It is evident by the significant improvement witnessed in mines and minerals department by a revenue increase of over 150 per cent over a period of two years. The contribution of the province in mining output is remarkable.

4.8.1 Tourism Hub

205. Khyber Pakhtunkhwa being a Tourism Hub plays a vibrant role in portaging a positive impact of Pakistan at the international level. Lust green valleys and ice-packed mountains of the province give a competitive edge to other provinces in terms of tourism. Its exotic beauty of northern areas captivates the tourist's interest around the globe. Tourists destinations with alluring natural beauty are also playing significant role in providing employment opportunities. Through tourism, Khyber Pakhtunkhwa has major contribution to the economy of the country.

4.9 Cultural and social status

206. Khyber Pakhtunkhwa – Land of the Valiant Pakhtuns nestled primarily on the Iranian Plateau, holds a significant strategic place in the country's geographical setting. The famous Khyber Pass links the province to Afghanistan sharing borders in the west and north, Azad Kashmir and the Northern Areas (the Pakistani-administered areas of the Kashmir region) to the east and northeast, Punjab province to the southeast, and Baluchistan province to the southwest. On the western boundary, along the Afghan border, lie the erstwhile federally administered tribal areas (FATA) which were recently

integrated with and merged into Khyber Pakhtunkhwa under the 25th Constitutional Amendment transferring all executive authority to Chief Minister KP and his cabinet.

207. Sloping down from the breathtaking beauty of the Hindu Kush to the sun baked plains of the Derajat, the province can be divided into two zones based on its diverse geography. The northern zone with its surreal landscape clad with snowy peaks and lush green pastures supports a cold climate with heavy rainfall and pleasant summers with the exception of Peshawar basin, which tends to be hot in summer and cold in winter with moderate rainfall. While the southern end with its contrasting spur of clay and sandstone hills stretching onwards from Peshawar to the Derajat Basin, is arid with hot summers and relatively cold winters and scanty rainfall. The major rivers that criss-cross the province are the Kabul, Swat, Chitral, Kunar, Siran, Panjkora, Bara, Kurram, Dor, Haroo, Gomal and Zhob.

5 ANALYSIS OF ALTERNATIVES

5.1 General

208. The project will primarily be a rehabilitation of selected roads along the existing alignment in nineteen districts of KPK. It also involves the improvement of the 32 bridges across various district of the KP province. The major construction work involved will be earthwork, subbase/Base Course, asphalt or concrete pavement, placement of drainage system, and installation of roadside features (see section 3).
209. Some alternatives for the proposed roads and bridges were considered. The environmental and socio-economic impacts of those alternatives were considered to find the best project option.

5.2 Alternatives for Roads and Bridges Rehabilitation Works

210. The following alternatives were considered for the road rehabilitation and improvement.

1. Roads and bridges Alternative:

- No project option
- Altogether a new route and Existing Roads and bridges rehabilitation

2. Logistic Sites

- Siting of Contractor's facilities e.g. labor camp site, and machinery yard on government land
- Siting the Contractor's facilities on private lands.
- Siting Contractor's facilities at most appropriate sites be in public land or private land.

3. Labor Options

- All local labor
- All non-native labor
- An admixture of local and non-native labor as per skill required.

4. Design Alternative

- Asphalt Roads
- RCC /JPJC Roads
- All-Weather Roads

5. Technology Alternatives-Environmental Aspects

- Batching Plant without Pollution Abatement Equipment
- Batching Plant with Pollution Abatement Equipment
- Asphalt Mixing Plant with Pollution Abatement Equipment
- Latest Modern machinery

5.3 Road Alternatives

5.3.1 No-Project Option

211. Within the framework of ADB’s SPS 2009, an important consideration on the “No Project” alternative is being devoted to. The “No-Project” alternative presents a case scenario in which the project is not to be done at all. By comparative evaluation, it can be inferred whether the project is necessary at all or provide some insights on how to properly proceed should the project be fully implemented.

212. The “No-Project” alternative scenario for the project means that the roads and bridges will stay “as it is”, in which no rehabilitation work will be done. No access within communities and to main roads and no tourism activities will be promoted. The roads and bridges affected will remain the same as they are.

- **Weakness and Threats**

If the project is not taken up at all then all the funds, efforts and inconvenience will be saved, and these will become available for diversion to other projects. No disturbance will be caused to people through the implementation process. The people benefiting out of a status quo will continue benefiting.

In the proposed project, a total of 89 roads have been shortlisted for the improvement, among them 33 roads are flood affected, 37 roads are access while 19 are for tourism purposes. All these roads are in poor condition having some unpaved stretches and do not meet the national and international design standards for roads. Along with this, 32 bridge rehabilitation have also been proposed. Keeping these roads and bridges in the existing condition can increase safety hazards, limit access to essential services and contribute to community isolation, hindering social and economic opportunities for the residents of KPK. The economic repercussions can affect tourism-dependent regions as poorly maintained roads discourage visitors, impacting local businesses.

- **Strengths and Opportunities**

The improvement of the roads and bridges will increase the development of the KP province. The proposed project can address safety concerns by enhancing road conditions, ensuring safer travel for both commuters and pedestrians, reducing the risk of accidents. Improved accessibility to essential services, such as healthcare and emergency response, becomes possible, particularly in remote or flood-prone areas. Furthermore, rehabilitation of roads stimulates economic growth by keeping better connectivity, reducing transportation costs, and supporting local businesses, especially those reliant on tourism. The promotion of tourism is itself a significant outcome, as well-maintained roads attract more visitors and contribute to increased economic conditions of the region.

Conclusions

The “No project option” reveals the withholding of development in the entire area, trade limitations and degradation of economic activities, therefore is not recommended.

5.3.2 Altogether New Route, Existing Roads and Bridges Rehabilitation

213. The proposed project focuses on rehabilitation and improvement of existing roads and bridges in KP. However, a comparison of rehabilitation of the existing roads alignment and construction of a new alignment was made and detailed in table 5.1.

Table 5-1: Analysis of Altogether a New Route and Existing Roads and bridges Rehabilitation

Impacts	Alternatives		
	New Alignments of the Proposed Road	Rehabilitation of the Existing Alignments	Remarks
Environmental Impacts			
Land Acquisition	Construction of a new road will require land making the project costly.	Rehabilitation of an existing roads and bridges will make the project budget friendly by eliminating the requirement of new land. No social issues will be arisen.	Rehabilitation of an existing roads and bridges is recommended, since it will require no additional land making the project financially and socially viable.
Tree Cutting	Clearing trees for new roads construction contributes to deforestation. A new alignment may involve the substantial tree cutting. In most of the roads.	Since, all the works are to be carried out within the existing RoW and on existing roads thus tree cutting is not involve. Also, in rehabilitation works there is less impact on forests and biodiversity.	Rehabilitation of the existing roads is recommended because of less chances of the tree cutting.
Habitat Disruption	A new road alignment often requires clearing large areas of land, potentially disrupting local ecosystems and displacing wildlife.	Utilizing existing alignments minimizes the need for additional land clearing, preserving local ecosystems and wildlife habitats.	Restoration of the existing road is recommended to avoid habitat disruptions during construction.
Resource Consumption	The construction process requires significant resources like concrete, asphalt, and steel in the altogether new alignment of road.	The rehabilitation of an existing alignment will require lesser resources comparative to the new alignment hence optimized resource consumption.	Using existing alignment will require lesser resources, hence recommended.
Air and Noise Pollution	Construction machinery and increased traffic during construction contribute to air and noise pollution, affecting both the immediate and surrounding areas.	The environmental impact of construction is significantly lower, resulting in less air and noise pollution. Rehabilitation works will ultimately improve the existing state of the environment.	Construction of new roads will require a longer time period and more construction work leading to higher pollution.
Social Impacts			
Traffic Disruptions and property loss	Construction activities will be prolonged and will increase traffic for a longer period impacting	Construction-related traffic issues will be minimized, overall, all existing situations will be improved.	Construction of a new road will take a longer period for construction leading to prolonged

Impacts	Alternatives		
	New Alignments of the Proposed Road	Rehabilitation of the Existing Alignments	Remarks
	local businesses and residents' daily activities, if it will pass through the urban areas. The new alignment may also involve the loss of the properties of local communities.	No property damage is involved in proposed rehabilitation works.	traffic disruptions and property damages.
Transportation	New alignment has their own environmental, social, and economic implication, such as huge land acquisition, social instability and less harmony, and high cost.	Improving access, tourism roads, and flood-affected roads in KPK promises a transformative impact on the province's connectivity and economy. The restoration of roads will not only facilitate the efficient movement of goods and people but also stimulates economic growth. Improved tourism roads can attract visitors, enhance the tourism sector, and generate revenue. Furthermore, a well-connected transportation network creates employment opportunities, and enhances disaster resilience. The overall accessibility to education and healthcare improves, positively influencing the quality of life for residents.	The restoration of roads in KPK is recommended due to the substantial socio-economic benefits

5.4 Logistic Sites

5.4.1 Siting of Contractor’s Facilities on Government Land

214. Construction work will be held in different districts of KP. To ensure smoother and timely construction of roads and bridges, the provision of adequate contractor facilities is essential. These facilities include campsites, areas for the asphalt and batching plant installation, storage areas, and office spaces, all of which are vital for providing safe residents to the workers and storing construction materials, equipment, and documentation. For this purpose, an adequate piece of land will be required near all the construction worksites.

▪ Strengths and Opportunities

If the contractor will get a government owned land for siting of the construction facilities, many benefits can be ensured. One of the most important advantages will

be cost saving and property loss. The absence of land acquisition will reduce the financial burden to the project. There will be very little possibility of local disturbance or manipulation from local communities and the contractor will have a free hand to manage his labor and works. In this scenario, the contractor will not be allowed to rent private agricultural land and therefore productive agricultural land will be saved. The activities and logistics of the contractor will be under full control of the project management and any adverse environmental or social spill over to outside territories will be eliminated.

- **Weakness and Threats**

Best suitable sites of required size and descriptions may not be available within RoW and the standard. By refusing to contract the option to go to adjacent private land, the management may be compromising with best site selection and other logistics and therefore overall efficiency of the execution of the contract. For creating enough space for contractors at places, situations may arise where resettlement cases with heavy payment may arise.

Conclusion

The construction work will take place across nineteen districts of KP, with construction of roads and bridges at various locations within each district. The availability of the government land at every concerned location will be difficult. Therefore, a mixed approach using both government owned land and private land is recommended. In presence of adequate and encumbrance free government owned land, the contractor may be given the option of using it for his labor camp, machinery yard and work bases. This is an acceptable option and is recommended.

5.4.2 Siting of Contractor's Facilities on Private Lands

- **Strengths and Opportunities**

Contractor will have flexibility in terms of location and layout, allowing contractors to choose sites that are most suitable to their operational needs and the requirements of the construction project. Moreover, the contractor can expand or modify facilities in the future based on evolving project requirements. Private land offers more privacy and security for contractor facilities, reducing the risk of unauthorized access and safeguarding construction materials and equipment. No obligations will fall upon the sponsor. No environmental challenge will come up at any stage.

- **Weakness and Threats**

The most prominent concern will revolve around substantial costs incurred in acquiring or leasing private land, imposing financial burdens on the project. Moreover, private land may be subject to restrictive covenants, and community opposition, limiting the flexibility of facility design and creating potential conflicts. This may also cause potential and unanticipated environmental and social impacts.

Conclusions

In locations where government land will be available, it will be recommended to use government owned land. If the contractor chooses to establish his facilities and labor camp on hired/leased private land, then client will bear no responsibility for his costs and commitments.

1.1 Sitting the Contractor’s Facilities at Appropriate Site, Be It Public Land or Private Land

- **Strengths and Opportunities**

An optimal site selection contributes to increased operational efficiency by reducing transportation costs and improving accessibility for both labor and materials. A strategically chosen location enhances the project's overall logistics and minimizes delays, thereby improving project timelines.

All sites will be approved by the Resident Engineer in site specific environment management plans. The contractor will not be bound to remain restricted to the sites proposed by the client Engineer and can plan his operations according to his operational convenience and availability of facilities and services, however, it will not impose any potential social or environmental implications. Where enough state land is not available, and private land is available adjacently, the contractor can make necessary adjustments without changing the site.

- **Weakness and Threats**

To the extent that the contractor moves out of government lands, establishment of camps, yards, and facilities close to villages can cause social problems. Adverse effects may be caused on the freedom of women to work in fields. Possibilities of spread of STDs and other infectious diseases will get greater chances of spread.

Conclusion

After settling the contractor on state land, this is the second-best option. But for contractor’s activities on private lands, the client holds no responsibility for the contractor's cost and commitments. Moreover, the RE approval shall be required before any commencement at site.

5.5 Labor

5.5.1 All Local labor

- **Strengths and Opportunities**

Hiring of local labor will contribute to the overall economic development of the project area. The use of local labor will reduce costs associated with relocating and accommodating external workers, enhancing project budget efficiency. Timely project commencement will be facilitated by the accessibility of local workers, ensuring efficient mobilization and adherence to project timelines. Moreover, employing individuals familiar with the project and subproject region's culture promotes effective communication and collaboration. Additionally, local workers will possess invaluable

knowledge of the weather patterns, and potential challenges, optimizing construction methods for durability and resilience.

- **Weakness and Threats**

The absence of a local workforce will decrease community economic development as financial benefits fail to circulate within the region. This exclusion may lead to strained relations with the community and potential resistance to the project. Furthermore, the reliance on external labor can increase costs due to expenses associated with relocating, accommodating, and transporting non-local workers. Delays in project completion may occur as external workers require additional time for mobilization. Cultural misunderstandings and communication challenges may also arise. However, three types of labor will be required: unskilled, semiskilled and skilled. All types of labor cannot be available locally. So binding contractors to employ all labor locally can put limitations on contractors.

Conclusion

It is not possible to rely entirely on local labor for all construction activities. So, this option is not acceptable. However, all unskilled labor openings must be given to locals.

5.5.2 All Non-Native Labor

- **Strengths and Opportunities**

Hiring of non-native labor will bring in a diverse range of skills and experiences, potentially enriching the project with a broader perspective on construction methods and techniques. Labor from outside will be pre-selected and ergonomically sound. Moreover, cultural diversity within the workforce will raise innovation and creativity, contributing to a dynamic project environment.

- **Weakness and Threats**

Bringing outside labor will take away economic benefits of employment from the local communities and they will not develop a sense of ownership for the project. The project objective of poverty alleviation, social uplift and capacity building will be defeated. A social problem will be created.

Conclusion

For unskilled work in the proposed project, a preference will be given to local labor to enhance economic and social benefits within the community. Conversely, skilled positions will prioritize the recruitment of both local and non-native labor considering their efficiency and expertise.

5.6 An Admixture of Both Local and Non-Native Labor

215. Analysis

- **Strengths and Opportunities**

Employing all the labor from nearby areas poses a limitation for the contractor, potentially impacting the efficiency and diversity of the workforce. To address this challenge, a mixture of both non-native and local workers as per their expertise is recommended. This approach acknowledges the need for specialized skills that non-native labor may bring, ensuring a more versatile and proficient workforce.

▪ **Weakness and Threats**

Because of the presence of the outsiders there are likely to be social losses. Income of local communities will reduce.

Conclusion

From the project implementation point of view, this option presents the best combination of local and outside labor. This option also presents an opportunity of transfer of skills from outside technicians to local workers.

5.7 Design Alternatives

- 216. In road design, several alternatives address specific challenges. All-weather roads, Asphalt roads and Reinforced Cement Concrete (RCC) were considered. The choice among these alternatives depends on factors such as climate, traffic volume, and regional requirements, emphasizing the need for a context-sensitive approach in road construction projects.
- 217. Table 5-2 below briefly summarise the difference between asphalt, RCC /JPJC road and all-weather road.

Table 5-2: Difference of Various Road types

Feature	Asphalt Road	RCC/JPJC Road	All Weather Road
Pavement Type	Flexible pavement made of asphalt cement and aggregates	Roller-compacted concrete (RCC) or Jointed plain concrete (JPJC) Rigid pavement made of reinforced concrete (RCC) or plain jointed concrete (JPJC)	Not specified, could be asphalt, concrete or other materials
Surface Type	Smooth surface suitable for high speeds and Low Noise	Generally rougher texture compared to asphalt, suitable for heavy traffic	Generally smoother than RCC/JPJC roads but may vary based on local standards
Construction	Typically has an asphaltic base course and wearing course	Defined thickness of concrete pavement, either reinforced with steel (RCC) or plain with joints (JPJC)	Typically involves multiple layers of materials compacted to form a base
Strength	Good load-bearing capacity, suitable for various traffic loads	High compressive strength, suitable for heavy traffic loads	Designed to withstand heavy traffic and adverse weather conditions

Feature	Asphalt Road	RCC/JPJC Road	All Weather Road
Durability	Less durable compared to concrete roads, can deform under heat	More durable and resistant to deformation	Designed to withstand extreme weather conditions year-round
Cost	Moderate	Generally higher due to the use of concrete	Usually, higher due to the additional materials and construction complexity
Maintenance	Requires periodic resurfacing and crack sealing	Requires less frequent maintenance compared to asphalt	Likely requires regular maintenance to address weather-related damage
Suitability	Suitable for areas with moderate traffic loads and climates	Suitable for heavy traffic loads and extreme weather conditions	Suitable for areas prone to extreme weather events

Strengths and Opportunities

Providing road design alternatives will optimize infrastructure for efficiency, cost-effectiveness, and enhance the durability of roads, reducing long-term maintenance costs. The safety of transportation will be improved, and travel time will be reduced. Moreover, climate-resilient designs ensure that roads can withstand extreme weather events, contributing to overall resilience.

Weakness and Threats

The lack of proper road designs will leave the roads more exposed to the impacts of climatic conditions, risking disruptions to essential transportation links. Economic opportunities may be disrupted, as the infrastructure may not effectively support diverse economic activities across various districts.

Conclusion

The planned project involves the construction of roads across the diverse topography of the KPK Province. Given the varied climatic conditions in different regions, the project proposes different road designs according to each area's specific climate. Table below summarized the road type recommended for each district.

Table 5-3: Design Alternatives

Districts	Alternative Road Type		
	Asphalt Road	RCC Roads	All-Weather Roads
Bunner	✓		
Battagram		✓	
Chitral			✓
Dir Upper			✓
Dir Lower		✓	
Charasada	✓		
Mardan	✓		
Kohistan Lower		✓	
Kohistan Upper			✓

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Districts	Alternative Road Type		
	Asphalt Road	RCC Roads	All-Weather Roads
Shangla			✓
Mansehra		✓	
Swat		✓	
DI Khan	✓		
Haripur		✓	
Torh Garh		✓	
Noshera	✓		
Swabi	✓		
Bannu	✓		
Karak	✓		
Kohat	✓		
Peshawar	✓		

5.8 Alternative Technology

218. Upgrading roads in the region is a critical necessity due to their diverse roles, serving tourism, providing access to remote areas, and addressing flood-prone routes. The focus on these upgrades reflects the region's primary concern for enhancing connectivity, supporting economic growth through tourism, and ensuring resilience during adverse weather conditions.

5.9 Technology Alternatives

219. A comparison of various technologies is made and preferred and selected based on the social and environmental impacts.

5.10 Technological Alternatives

220. A comparison of various technologies is made in construction machinery and preferred and selected based on the social and environmental impacts.

Sr. No.	Machinery	Social Impacts			Environmental Impacts		
		Minimum	Moderate	Adverse	Minimum	Moderate	Adverse
1	Batching Plant without Pollution Abatement Equipment			✓			✓
2	Batching Plant with Pollution Abatement Equipment	✓			✓		
3	Asphalt Mixing Plant without Pollution Abatement Equipment		✓				✓
4	Asphalt Mixing Plant with Pollution	✓			✓		

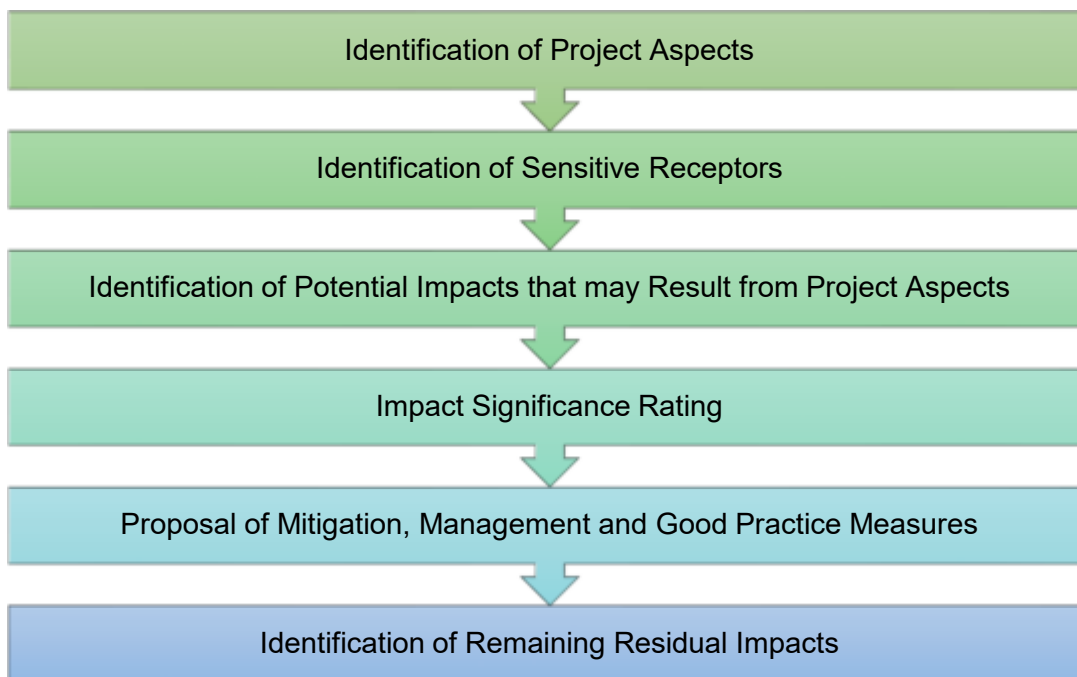
Sr. No.	Machinery	Social Impacts			Environmental Impacts		
		Minimum	Moderate	Adverse	Minimum	Moderate	Adverse
	Abatement Equipment						
5	Motor Grader	✓			✓		
6	Road Roller Machine	✓				✓	
7	Forklift Truck		✓		✓		
8	Truck Crane	✓			✓		
9	Vibratory Rollers		✓		✓		
10	Oil Tankers	✓			✓		
11	Excavators / Loaders		✓		✓		
12	Small Vehicles	✓			✓		
13	Grover	✓			✓		

6 ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1 Impact Assessment Methodology

221. This IEE follows a set format during the impact assessment process. As shown in the flow chart and described further below.

Table 6-1: Impact Assessment Process



Project Aspects

222. Firstly, the main environmental aspects of the Project are noted. An environmental aspect is any activity of the Project that interacts with the environment. E.g., an aspect of the Project that may impact upon air quality will be the movement of construction vehicles on unpaved roads through rural settlements.

Identification of Sensitive Receptors

223. Once the main aspects of the Project have been identified any sensitive receptors within the Project area of influence are noted. Examples of sensitive receptors include residents, rivers, groundwater, birds, etc. Identification of receptors is a key part of the impact assessment process as without a receptor there will be no impact. For example, if a substation generates significant noise but there are no sensitive receptors who can hear the noise, then there will be no noise impact on them.

Identification of Impacts

224. Thirdly, the potential impacts of the identified aspects are outlined and how they could impact upon the identified receptors, in the case above, this could be the movement of a construction vehicles creating dust on an unpaved road which impacts upon local villagers.

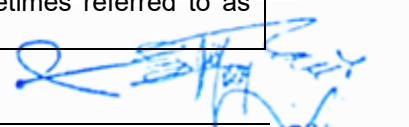
Impact Significance Rating

- 225. Evaluation of impact significance follows a stepwise process as set out below.
- 226. **Assign sensitivity ratings to receptors** - The sensitivity of a receptor is defined on a scale of Very Low, Low, Moderate, High or Very High guided by the definitions for biophysical, ecological and social receptors below. These are derived from the baseline information, which shall be used to support the sensitivity ratings in the description of impact.
- 227. **Determine the impact magnitude (or consequence) ratings** - Magnitude (or Consequence) is determined based on a combination of the “intensity”, “duration” and “extent” of the impact following the designations set out below. Magnitude (or Consequence) is assigned to the pre-mitigation impact (i.e. before additional mitigation measures are applied but taking into account embedded controls specified as part of the project description) and residual impacts after additional mitigation is applied.
- 228. **Determine impact significance rating** - The significance of an impact is a function of the intensity and the sensitivity of the impact determined using the matrix table below and is assigned to the predicted impact pre-mitigation and post-mitigation (residual) after considering all possible feasible mitigation measures in accordance with the mitigation hierarchy.
- 229. **Assign additional ratings to describe the impact** - Qualifying ratings are assigned to criteria such as probability (or likelihood of the impact occurring), confidence (in the impact prediction), mitigation potential, extent of resource loss (as defined below). reversibility of impact and potential for cumulative impacts.
- 230. **Applying the mitigation hierarchy** - Identification of mitigation measures in accordance with the mitigation hierarchy is done throughout the IEE process with emphasis placed on avoiding significant impacts where feasible. Certain avoidance mitigation measures may be identified early and become ‘embedded’ into the project design and specified in the project description. These embedded controls are not ‘added’ to the list of mitigation measures or used to determine the post-mitigation significance. Additional mitigation measures may be identified during the impact assessment process and those agreed with the proponent will be used to assess the post-mitigation significance ratings.

Definitions of Impact Types and Criteria Used

- 231. **Impact Types** - The table below defines the criteria used to categorise and describe impacts.

Term	Definition
Nature of Impact	The direction of impact and whether it leads to an adverse effect (negative), beneficial effect (positive) or no effect (neutral)
Positive	An impact that is considered to represent an improvement to the baseline conditions or introduces a positive change to a receptor.
Negative	An impact that is considered to represent an adverse change from the baseline conditions or receptor, or introduces a new adverse effect.
Neutral	An impact that has no or negligible effect on the receptor.
Type	Cause and effect relationship between the project activity and the nature of effect on receptor
Direct	Impacts that result from a direct interaction between a proposed project activity and the receiving environment (e.g. effluent discharge and receiving water quality). Sometimes referred to as primary impacts.
Indirect	Impacts that are not a direct result of a proposed project, often produced away from or as a result of a complex impact pathway. Sometimes referred to as secondary impacts.



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Term	Definition
Induced	A type of indirect impact resulting from factors or activities caused by the presence of the Project but which are not always planned or expected (e.g. human in-migration along new access or for jobs creating increased demand on resources).
Residual	The impacts that remain after implementation of the project and all associated mitigation and other environmental management measures.

232. **Definitions of Impact Assessment Criteria and Categories Applied** - Definitions of the criteria used in assessing impact significance and the assigned categories, and the additional criteria used to describe the impacts, are summarised in the table below.

Criterion	Definition	Categories
Sensitivity	Sensitivity is a rating given to the importance and/or vulnerability of a receptor (e.g. conservation value of a biodiversity feature or cultural heritage resource or social receptor).	Very Low Low Medium High Very High
Magnitude (or Consequence)	A term describing the actual change predicted to occur to a resource or receptor caused by an action or activity or linked effect. It is derived from a combination of Intensity, Extent and Duration and takes into account scale, frequency and degree of reversibility	Very Low Low Medium High Very High
Intensity	A descriptor for the degree of change an impact is likely to have on the receptor which takes into account scale and frequency of occurrence.	Very Low Low Medium High
Extent	The spatial scale over which the impact will occur.	Site Local National Regional International /Transboundary
Duration	Time scale over which the consequence of the effect on the receptor/s will last. [Note that this does not apply to the duration of the project activity]. The terms 'Intermittent' and 'Temporary' may be used to describe the duration of an impact.	Short-term Medium-term Long-term Permanent
Probability	A descriptor for the likelihood of the impact occurring. Most assessed impacts are likely to occur but Probability is typically used to qualify and contextualise the significance of unplanned events or major accidents.	Unlikely Possible Likely Highly Likely Definite
Confidence	A descriptor for the degree of confidence in the evaluation of impact significance.	Low Medium High Certain
Mitigation potential	A descriptor for the degree to which the impact can be mitigated to an acceptable level.	None Very Low Low Medium High

Determination of Sensitivity



233. Sensitivity is a term that covers the ‘importance’ (e.g. value of an ecological receptor or heritage resource) or ‘vulnerability’ (e.g. ability of a social receptor to cope with change) of a receptor to a project-induced change. It takes into account ‘Irreplaceability’ - measure of the value of, and level of dependence on, impacted resources to society and/ or local communities, as well as of consistency with policy (e.g. conservation) targets or thresholds.
234. Broad definitions of sensitivity ratings for social, ecological, and physical/abiotic receptors are defined below. These are not exhaustive and may be modified on a case-by-case basis, as appropriate. Additional ratings can be developed for other receptors such as cultural heritage.

Sensitivity Rating	Definition
Social Receptors	Individuals, communities, or groups of stakeholders
Very Low	Receptors who are not vulnerable or susceptible to project-related changes and have substantive resources and support to understand and anticipate Project impacts. Such receptors have the ability to avoid negative Project impacts, or to cope with, resist or recover from the consequences of a such an impact with negligible changes to their lives, or will derive little benefit or opportunities from the project.
Low	Receptors who have few vulnerabilities and are marginally susceptible to project-related changes but still have substantive resources and support to understand and anticipate a Project impact. Such receptors are able to easily adapt to changes brought about by the project with marginal impacts on their living conditions, livelihoods, health and safety, and community well-being, or will derive marginal benefits or opportunities from the project.
Medium	Receptors have some vulnerabilities and are more susceptible to project-related changes given they only have moderate access to resources, support, or capacity to understand and anticipate a Project impact. Such receptors are not fully resilient to Project impacts but are generally able to adapt to such changes albeit with some diminished quality of life. For positive impacts, these receptors are likely to derive a moderate level of benefit or opportunities from the project.
High	Receptors are vulnerable and susceptible to project-related changes, and have minimal access to resources, support, or capacity to understand and anticipate a Project impact. Such receptors are not resilient to Project impacts and will not be able to adapt to such changes without substantive adverse consequences on their quality of life. For positive impacts, these receptors are likely to derive a substantial level of benefits or opportunities from the project.
Very High	Receptors are highly vulnerable and have very low resilience to project-related changes. By fact of their unique social setting or context, such receptors have a diminished or lack of capacity to understand, anticipate, cope with, resist or recover from the consequences of a potential impact without substantive external support. For positive impacts, receptors are likely to derive substantial benefits or opportunities from the project which could lead to significant and sustained improvement in their quality of life.
Ecological Receptor	Species, habitats or ecosystems including processes necessary to maintain ecosystem functions
Very low	Species or habitats with negligible importance for biodiversity including habitats that are largely transformed or highly modified.
Low	Species or habitats listed as Least Concern (LC) on the International Union for Conservation of Nature (IUCN) Red List or on regional or national Red Lists and/or

Sensitivity Rating	Definition
	habitats or species which are common and widespread, of low conservation interest, or habitats which are degraded and qualify as 'modified habitat' under international definitions (e.g. IFC or World Bank standards).
Medium	Species, habitats or ecosystems listed as globally Vulnerable (VU) or Near Threatened (NT) on IUCN Red List; or listed as VU or NT on national or regional Red Lists, or which meet the IUCN criteria based on expert-driven biodiversity planning processes. It includes habitats that meet definitions of 'natural habitat'; or ecosystems with important functional value in maintaining the biotic integrity of these habitats or VU or NT species.
High	Species, habitats or ecosystems listed as globally Endangered (EN) or Critically Endangered (CR) by IUCN, or listed as EN/CR on national or regional Red Lists; or which meet IUCN criteria for range restricted species or which meet the definition of migratory and congregatory species, but which do not qualify as Critical Habitat based on IUCN Key Biodiversity Area thresholds. It includes habitats or ecosystems which are important for meeting national conservation targets based on expert-driven national or regional systematic conservation planning processes, but which do not meet global IUCN thresholds. It can also include protected areas such as national parks, marine protected areas or ecological support areas designated for biodiversity protection containing species that are nationally or globally listed as EN or CR, or other designated areas important for the persistence of EN/CR species or habitats.
Very high	Species, habitats or ecosystems listed as globally Endangered (EN) or Critically Endangered (CR) by IUCN, or listed as EN/CR on expert-verified national or regional Red Lists; or which meet IUCN criteria for range-restricted or migratory /congregatory species and which meet IUCN thresholds for Key Biodiversity Areas. It includes habitats or ecosystems which are of high importance for maintaining the persistence of species or habitats that meet critical habitat thresholds. Habitats of high sensitivity may typically include legally protected areas that meet IUCN categories 1, 1a and 1b, or KBAs or Important Bird Areas (IBAs) with biodiversity features that meet the IUCN KBA criteria and thresholds.
Physical Abiotic Receptors	Water quality, soil quality, air quality, noise levels
Very Low	Receptors are highly resilient to project-induced change and changes remain undetectable and within any applicable thresholds.
Low	Receptors are resilient to project-induced change and changes, while detectable, are within the range of natural variation and remain within any applicable thresholds.
Medium	Receptors are moderately resilient to project-induced changes, but these changes are easily detectable, exceed the limit of the normal range of variation on an intermittent basis and / or periodically exceed applicable thresholds.
High	Receptors are vulnerable to project-induced change and changes are readily detectable, well outside the range of natural variation or occurrence, and regularly exceed any applicable thresholds.
Very High	Receptors are highly vulnerable to project-induced change and changes are easily detectable, fall well outside the range of natural variation or occurrence, and will continually exceed any applicable thresholds.

Determination of Magnitude (or Consequence)

235. **Definitions of Criteria Used to Derive Magnitude (or Consequence)** - The term 'magnitude' (or 'consequence') describes and encompasses all the dimensions of the predicted impact including:

- the nature of the change (what is affected and how);
- its size, scale or intensity;

- degree of reversibility; and
- its geographical extent and distribution.

236. Taking the above into account, Magnitude (or Consequence) is derived from a combination of ‘Intensity’, ‘Duration’ and ‘Extent’. The criteria for deriving Intensity, Extent and Duration are summarised below.

Criteria	Rating	Description
Criteria for ranking of the INTENSITY of environmental impacts taking into account reversibility and scale	Very Low	Negligible change, disturbance or nuisance which is barely noticeable or may have minimal effect on receptors or affect a tiny proportion of the receptors.
	Low	Minor (Slight) change, disturbance or nuisance which is easily tolerated and/or reversible in the short term without intervention, or which may affect a small proportion of receptors.
	Medium	Moderate change, disturbance or discomfort caused to receptors or which is reversible over the medium term, and/or which may affect a moderate proportion of receptors.
	High	Prominent change, or large degree of modification, disturbance or degradation caused to receptors or which may affect a large proportion of receptors, possibly entire species or community and which is not easily reversed.
Criteria for ranking the EXTENT / SPATIAL SCALE of impacts	Site	Impact is limited to the immediate footprint of the activity and immediate surrounds within a confined area.
	Local	Impact is confined to within the project concession / licence area and its nearby surroundings.
	Regional	Impact is confined to the region, e.g. coast, basin, catchment, municipal region, district, etc.
	National	Impact may extend beyond district or regional boundaries with national implications.
	International	Impact extends beyond the national scale or may be transboundary.
Criteria for ranking the DURATION of impacts	Short term	The duration of the impact will be < 1 year or may be intermittent.
	Medium term	The duration of the impact will be 1-5 years.
	Long term	The duration of the impact will be 5-25 years, but where the impact will eventually cease either because of natural processes or by human intervention.
	Permanent	The impact will endure for the reasonably foreseeable future (>25 years) and where recovery is not possible either by natural processes or by human intervention.

237. **Determining Magnitude (or Consequence) Ratings** - Once the intensity, extent and duration are defined based on the definitions above, the magnitude (or Consequence) of negative and positive impacts is derived based on the table below. It should be noted that there may be times when these definitions may need to be adjusted to suit the specific impact where justification should be provided. For instance, the permanent loss of the only known occurrence of a species in a localised area of impact can only achieve a “High” magnitude rating but could, in this instance, warrant a Very High rating. The justification for amending the rating should be indicated in the impact table.

Magnitude (or consequence) rating	Description*
Very High	Impacts could be EITHER: of high intensity at a regional level and endure in the long term;

Magnitude (or consequence) rating	Description*
	OR of high intensity at a national level in the medium or long term; OR of medium intensity at a national level in the long term.
High	Impacts could be EITHER: of high intensity at a regional level and endure in the medium term; OR of high intensity at a national level in the short term; OR of medium intensity at a national level in the medium term; OR of low intensity at a national level in the long term; OR of high intensity at a local level in the long term; OR of medium intensity at a regional level in the long term.
Medium	Impacts could be EITHER: of high intensity at a local level and endure in the medium term; OR of medium intensity at a regional level in the medium term; OR of high intensity at a regional level in the short term; OR of medium intensity at a national level in the short term; OR of medium intensity at a local level in the long term; OR of low intensity at a national level in the medium term; OR of low intensity at a regional level in the long term.
Low	Impacts could be EITHER of low intensity at a regional level and endure in the medium term; OR of low intensity at a national level in the short term; OR of high intensity at a local level and endure in the short term; OR of medium intensity at a regional level in the short term; OR of low intensity at a local level in the long term; OR of medium intensity at a local level and endure in the medium term.
Very Low	Impacts could be EITHER of low intensity at a local level and endure in the medium term; OR of low intensity at a regional level and endure in the short term; OR of low or medium intensity at a local level and endure in the short term. OR Zero to very low intensity with any combination of extent and duration.

* Note: For any impact that is considered to be "Permanent" or "International" apply the "Long-Term" and "National" ratings, respectively. For impacts at the "Site" or "Local" level apply the "Local" level rating.

Determination of Impact Significance

238. **Matrix to Derive Impact Significance** - The significance of an impact is based on expert judgement of the sensitivity (importance or vulnerability) of a receptor and the magnitude (or consequence) of the effect that will be caused by a project-induced change. In summary, the impact assessment method is based on the following approach:

- Significance = Magnitude x Sensitivity
- Where Magnitude = Intensity + Extent + Duration

239. Once ratings are applied to each of these parameters the following matrix is used to derive Significance:



		Sensitivity				
		Very Low	Low	Medium	High	Very High
Magnitude (or consequence)	Very Low	Negligible	Negligible	Very Low	Low	Low
	Low	Very low	Very low	Low	Low	Medium
	Medium	Low	Low	Medium	Medium	High
	High	Medium	Medium	High	High	Very High
	Very High	High	High	High	Very High	Very High

240. **Definitions of Significance Ratings** - Broad definitions of impact significance ratings are provided in the table below. Impacts of ‘High’ and ‘Very High’ significance require careful evaluation during decision-making and need to be weighed up against potential long-term socioeconomic benefits of the project to inform project authorisation. Where there are residual biodiversity impacts of ‘High’ and ‘Very High’ significance this will require careful examination of offset feasibility and confirmation that an offset is possible prior to decision-making.

Very High	<p>Impacts where an accepted limit or standard is far exceeded, changes are well outside the range of normal variation, or where long-term to permanent impacts of large magnitude (or consequence) occur to highly sensitive resources or receptors. For adverse residual impacts of very high significance, there is no possible further feasible mitigation that could reduce the impact to an acceptable level or offset the impact, and natural recovery or restoration is unlikely. The impact may represent a possible fatal flaw and decision making will need to evaluate the trade-offs with potential social or economic benefits.</p> <p>Positive social impacts of very high significance would be those where substantial economic or social benefits are obtained from the project for significant duration (many years).</p>
High	<p>Impacts where an accepted limit or standard is exceeded; impacts are outside the range of normal variation or adverse changes to a receptor are long-term. Natural recovery is unlikely or may only occur in the long-term and assisted and ongoing rehabilitation is likely to be required to reduce the impact to an acceptable level. High significance residual impacts warrant close scrutiny in decision-making and strict conditions and monitoring to ensure compliance with mitigation or other compensation requirements.</p> <p>Positive social impacts of high significance would be those where considerable economic or social benefits are obtained from the project for an extended duration in the order of several years.</p>
Medium	<p>Moderate adverse changes to a receptor where changes may exceed the range of natural variation or where accepted limits or standards are exceeded at times. Potential for natural recovery in the medium-term is good, although a low level of residual impact may remain. Medium impacts will require mitigation to be undertaken and demonstration that the impact has been reduced to as low as reasonably practicable (even if the residual impact is not reduced to Low significance).</p> <p>Positive social impacts of medium significance would be those where a moderate level of benefit is obtained by several people or a community, or the local, regional or national economy for a sustained period, generally more than a year.</p>
Low	<p>Minor effects will be experienced, but the impact magnitude (or consequence) is sufficiently small (with and without mitigation) and well within the range of normal variation or accepted standards, or where effects are short-lived. Natural recovery is expected in the short-term, although a low level of localised residual impact may remain. In general, impacts of low significance can be controlled by normal good practice but may require monitoring to ensure operational controls or mitigation is effective. Positive social impacts of low significance would be those where a few people or a small proportion of a community in a localised area may benefit for a few months.</p>

Very Low	Very minor effects on resources or receptors are possible but the predicted effect represents a minimal change to the distribution, presence, function or health of the affected receptor, and no mitigation is required.
Negligible	Predicted impacts on resources or receptors of very low or low sensitivity are imperceptible or indistinguishable from natural background variations, and no mitigation is required.

Mitigation, Management and Good Practice Measures

- 241. Wherever the Project is likely to result in unacceptable impact on the environment, mitigation measures are proposed (over and above the inherent design measures included in the Project description). In addition, good practice measures may be proposed however these are unlikely to change the impact significance. In the case of positive impacts, management measures are suggested to optimize the benefits to be gained.
- 242. The following mitigation hierarchy will be utilized in selecting practical mitigation measures for unacceptable impacts as follows (in order of preference):
 - Avoid the impact wherever possible by removing the cause(s).
 - Reduce (minimize) the impact as far as possible by limiting the cause(s).
 - Ameliorate (mitigate) the impact by protecting the receptor from the cause(s) of the impact.

Residual Impacts

- 243. Once mitigation measures are declared and committed to, the next step in the impact assessment process is to assign residual impact significance. This is essentially a repeat of the impact assessment steps discussed above, considering the assumed implementation of the additional declared mitigation measures.
- 244. The final step is providing compensatory measures to offset the impact, particularly where an impact is of high significance and none of the above are appropriate, e.g., for impacts to natural and potential critical habitat.

6.2 Design Phase Impacts and Mitigation Measures

6.2.1 Design Phase Impact Screening

Potential Impact	Intensity	Extent	Duration	Magnitude	Sensitivity	Significance	Probability
Change in temperature	M	Regional	LT	High	M	High	H
Increased precipitation	H	Regional	LT	Very High	H	Very High	H
Flooding	M	Local	LT	Medium	H	High	M
Landslides	M	Local	LT	Medium	H	High	M
Seismic events	H	Regional	Perm	Very High	H	Very High	H
Loss of Land / Livelihood	L	Site	ST	Low	M	Low	L
Tree cutting	VL	Site	MT	Very Low	M	Low	VL
Encroachment of protected areas	L	Local	ST	Low	H	Moderate	L

6.2.2 Climate Related Risks and Impacts

245. The key receptor identified are the Project Roads which could be impacted significantly if adequate design measures are not included to counter climate change. Deterioration of the road may also lead to potential traffic safety issues which would impact upon road users. Indirectly, residents and businesses could be affected by flooding caused by inadequate drainage capacity, especially the roads such as RRD_UCH_NR1, N-CHT-6, N-CHT-7, KPR_DIK_NR11, KPR_DIK_NR13, RRD_DIK_R1, RRD_DIK_R2, RRD_DIK_R4, RRD_DIK_R6, RRD_DIK_R7, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_R1, RRD_DRU_NR3, RRD_DRU_NR4, KPR_KRK_NR5, RRD_KRK_R1, RRD_KRK_R3.

246. A Climate Change Risk Assessment for KP indicates the following potential issues and risks applicable to the project and subproject, especially for the roads affected by the floods:

6.2.2.1 Change in Temperature:

- Potential deterioration of pavement integrity, such as softening, traffic related rutting, and migration of liquid asphalt due to increase in temperature (potentially by 4.6 degrees Celsius by 2085)⁹.
- Potential corrosion of steel reinforcements in concrete structures due to increase in surface salt levels in some locations resulting from increased evaporation due to increased temperatures.

6.2.2.2 Change in precipitation levels:

- Damage to roads and drainage systems (bridges and culverts) due to flooding - more frequent as well as intense and heavy precipitation events can cause immediate damages, undermine road structural integrity, affect the maintenance of roads, bridges, and drainage systems.
- Increases in heavy precipitation events/floods will also cause more weather-related accidents due to vehicle and road damages and poor visibility, delays, and traffic disruptions. However, embankments heights are being reduced to limit fatalities and serious injuries caused when vehicles roll off the road.
- Increase in scouring of roads, bridges, and support structures.

6.2.2.3 Mitigation Measures

- Climate resilience has been ensured through selection of sub-base material suitable for all weather conditions. The sub-grade and the base will be sufficiently stable as per international standards.
- Provision of appropriate culverts, box-culvert, side drain, water drains, protection walls, etc. have been given in the roads and bridges design especially for RRD_UCH_NR1, N-CHT-6, N-CHT-7, KPR_DIK_NR11, KPR_DIK_NR13, RRD_DIK_R1, RRD_DIK_R2, RRD_DIK_R4, RRD_DIK_R6, RRD_DIK_R7, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_R1, RRD_DRU_NR3, RRD_DRU_NR4, KPR_KRK_NR5, RRD_KRK_R1, RRD_KRK_R3.

⁹ <https://www.ifc.org/content/dam/ifc/doc/2023/ifc-general-ehs-guidelines.pdf>

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.ipcc.ch%2Fapps%2Fnjlite%2Fsrsex%2Fnjlite_download.php%3Fid%3D6159&psig=AOvVaw1bfzDK9yAetjRkRDW9PxAw&ust=1720704238097000&source=images&cd=vfe&opi=89978449&ved=0CAYQrpoMahcKEwiA7rH4yJyHAXUAAAIAHQAAAAQBA

- For roads and bridges under extreme risk (such as RRD_DIK_R1, RRD_DIK_R4, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_NR3, RRD_DRU_NR4, KPR_KRK_NR5, RRD_KRK_R1, RRD_KRK_R3) will be designed in accordance with extreme climate scenario i.e. SSP3-7.0 or above.
- Considering heavy rainfall, existing culverts and drains have been resized in the design in accordance with the recommendation of climate change vulnerability assessment report of KPRRD especially of RRD_DIK_R1, RRD_DIK_R4, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_NR3, RRD_DRU_NR4, KPR_KRK_NR5, RRD_KRK_R1, RRD_KRK_R3 roads.
- Proactive maintenance regime will be applied for roads and bridges maintenance during the operations phase.
- To reduce the CO₂ emissions of the project the low carbon products such as slag, fly ash etc, will be used where available as a blend with mix cement products as proposed in climate change vulnerability assessment report of KPRRD.

6.2.2.4 Residual Impact

Table 6-2: Climate Related Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Change in temperature	High	Design measures should help ensure residual impacts are reduced to low significance.	Low
Increased precipitation	Very high	Even with the incorporation of the proposed design measures it is still possible that the roads could be impacted by extreme precipitation events. In the short term the design measures should ensure that the significance of impacts is reduced to low, but in the longer term more extreme climate events could have greater impacts on the roads.	Low

6.2.3 Natural Hazard Risks (Flooding, Earthquakes, etc.)

Impacts

247. The following geohazards may impact upon the Project structures:

- Seismic events especially on roads such as BTG-16:, BTG-2:, N-BUN-2: RRD_UCH_NR1, N-CHT-1:, KPR_DIK_NR13, RRD_DIK_R1, RRD_DIK_R2, N-CHT-2, SNG-28:, SNG-20:, T-22, T-12 (for details refer to serial 4.2.3. and table 4-3 and 4-4 in baseline section)
- Floods – discussed specifically under the topic of climate change

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- Further, poor design measures could lead to increased flooding and potential induce landslides.
- Landslides especially on roads such as SNG-61: SNG-20, SNG-61, SNG-28, SNG-29, TGH-1, N-CHT-9, T-42, SWT-5 etc. Landslides above and below roads on steep slopes could significantly impact the road structure itself as well as endangering the lives of people moving along the road or living close to potential landslide areas. Landslides can be naturally occurring, but they can also be triggered by activities external to the Project, e.g., poor design of cut slope and inadequate slope protection.
- Rainfall and nearest river (Swat River/ Kabul River, Kurrum and Kunhar river Warsacanal and bridge seasonal flows, etc) can cause flooding in the project area, particularly during the monsoon season, due to inadequate storm and sewer system within the area. Floods in every nullah and river in the surroundings in the past were triggered by extreme rainfall events.
- Some of the project roads are located in the seismic Zone 2B and 3 (Chitral, Swat, Dir roads and bridges especially for roads such BTG-16:, BTG-2:, N-BUN-2: RRD_UCH_NR1, N-CHT-1:, KPR_DIK_NR13, RRD_DIK_R1, RRD_DIK_R2, N-CHT-2, SNG-28:, SNG-20:, T-22, T-12 (for details refer to serial 4.2.3. and tables 4-3 and 4-4 in baseline section) and thus there is risk to the project related to seismic events.

6.2.3.1 Mitigation Measures

248. Required provisions in the project design, such as storm water drainage, side drain have been incorporated into the roads’ design to cater to extreme weather events, including those anticipated as a result of climate change vulnerability assessment of the RRDP.
249. It will be ensured that all Project components are designed and constructed in accordance with national design standards for earthquakes such as Building Codes of Pakistan, 2021¹⁰.
250. It will be ensured that detailed designs include slope protection measures to prevent/manage landslides accounting for future climate change aspects.

6.2.3.2 Residual Impact

Table 6-3: Natural Hazard Related Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Flooding	High	Even with the incorporation of the proposed design measures it is still possible that the roads could be impacted by extreme precipitation events.	Low
Landslides	High	Slope protection measures and including of suitably graded slopes during the design phase should help	Low

¹⁰ <https://codes.iccsafe.org/content/PKBC2021P1/preface>



Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
		ensure that impact of landslides during the operational phase will be low.	
Seismic events	Very High	Design measures should ensure that all seismic events do not have significant impacts to infrastructure.	No significant residual impacts as long as designs incorporate national standards for earthquake loading.

6.2.4 Loss of Land and Livelihood

6.2.4.1 Impact

251. Any change in project alignment could result in the loss of agricultural or other types of land for the local community. However, since the available RoW is being used, no direct impacts on land is expected. Nevertheless, some livelihood impacts for the locals can be expected, due to potential accessibility issues during construction. Livelihood impacts may also be expected for informal vendors doing business on or along the roads of the project. These impacts are not anticipated for the bridges.

6.2.4.2 Mitigation

252. Since all the project activities are within RoW therefore, mitigations for loss of land are not required.

253. The social impacts assessment also indicates that no potential impacts are at site. However, any potential unforeseen loss of livelihood during the construction will be compensated as per the provisions of resettlement policy framework (RPF) of the project.

6.2.4.3 Residual Impact

Table 6-4: Livelihood and Land Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Loss of land / livelihood	Low	Management of any livelihood impacts through the RPF should ensure that there are no significant residual impacts	None

6.2.5 Cutting of Trees

6.2.5.1 Impact

254. Tree cover in project area is significant along the Chitral, Swat, Dir roads. Therefore, unforeseen cutting of trees due to project activities (establishment of asphalt and batching plant site) might have been a significant impact. It is anticipated that around 3970 bushes (sanatha species) will be cut down mostly at N-MLK-1, N-MLK-2, SNG-14, SNG-30, SNG-14, N-CHT-2, TGH-1, DRL-35. Since, most of the mature trees are of coniferous and deodar, they will not be disturbed due to rehabilitation works.



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6.2.5.2 Mitigation

- 255. It will be ensured that contractor strictly adheres to the design and no deviation with the design occurs during the implementation of subproject.
- 256. No tree cutting will be allowed outside the RoW for any project related activity, including setting up of the construction camps.
- 257. In case the contractor will uproot any tree for establishment of asphalt and batching plant sites, compensatory trees with a ratio of 1:10 will be planted by the contractor with own cost.
- 258. To plant the trees with a ratio of 1:10 (as per KP forest department), a tree plantation plan shall be prepared in consultation with the KP Forest department and the concurrence will also be obtained from the ADB before the start of the operations of the project roads.

6.2.5.3 Residual Impact

Table 6-5: Tree Cutting Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Tree cutting	Low	None identified	No significant residual impacts

6.2.6 Impacts to Nationally and Internationally Designated Sites

6.2.6.1 Impact

- 259. A few of the proposed roads and bridges are located near the nationally protected areas and internationally designated sites (see **Error! Reference source not found.** and **Error! Reference source not found.**). Construction activities and workers could encroach into these areas and impact upon special status flora and fauna. It is also possible that construction camps, plant, and haul / access roads as well as borrow pits and quarries, could be located in these areas.
- 260. Three roads are located within the boundary of Palas Valley, identified as an area of potential critical habitat based on the presence of a significant population of the Western Tragopan. As noted previously in this report, the Tragopan is found at higher elevations than the proposed roads and therefore are unlikely to be affected directly by construction works. Kayal valley is located at elevations where the Tragopan could be found, but its population in this valley is thought to be lower than in Palas Valley.
- 261. The Palas Valley is home to two other endangered species besides the Western Tragopan - the Himalayan Musk Deer (*Moschus leucogaster*) and the Snow Leopard. The Musk Deer typically lives in forested and alpine areas at elevations between 2,500 and 5,000 masl, while the Snow Leopard prefers higher altitudes above 3000 masl. Given their preference for these higher-elevation habitats, these species are unlikely to be directly impacted by the proposed roads construction activities
- 262. Upgrading of the project roads and bridges will generate some additional traffic on the roads, e.g. through promoting access to tourism sites. This could lead to more people accessing the designated sites and potentially affecting site habitat.

6.2.6.2 Mitigation

- 263. For all roads close to nationally protected areas sites the following conditions will be applied:

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- No works will be allowed within the boundary of the nationally protected areas.
 - No access / haul routes will be allowed through the nationally protected areas.
 - No construction camps, batching plants, asphalt plants, borrow pit, quarry, etc, shall be permitted within the nationally protected areas (including plant / pits with existing permits and licenses).
264. For all roads close to internationally designated sites the following conditions will be applied:
- No works will be allowed above 1,350 masl in Palas Valley.
 - No access / haul routes will be allowed above 1,350masl in Palas Valley.
 - No construction camps, batching plants, asphalt plants, borrow pit, quarry, etc, shall be permitted above 1,000 masl in Palas Valley or 1,500masl in Kayal Valley. (including plant / pits with existing permits and licenses).
265. During the operational phase the regional government will be responsible for promoting responsible tourism and placing signs adjacent to the respective roads and nationally and internationally designated sites informing people of the status of the site and not to encroach into the area without relevant permissions. Residual Impact

Table 6-6: Protected Areas Residual Impacts

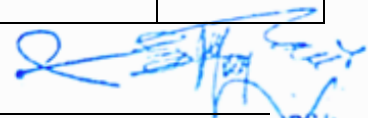
Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Encroachment into designated sites	Low	Prohibiting siting of camps, haul routes, etc, in protected areas would ensure that residual impacts are generally avoided. However, there still remains the risk of access to sites being increased during the operational phase due to the upgraded roads. Residual impact significance should however, be low as any change in traffic levels is not anticipated to be highly significant.	Low

6.3 Construction Phase

266. The activity wise screening of potential impacts during the construction phase is provided in Table 6.5 while details are given in subsequent paragraphs:

Table 6-7: Activity Wise, Screening of Impacts during Construction Phase

Potential Impact	Intensity	Extent	Duration	Magnitude	Sensitivity	Significance	Probability
Air Quality ((Release of exhaust gases, Dust, VOCs)							
Release of exhaust gases	Low	Local	Short	Very Low	Low	Negligible	Definite
Dust	Medium	Local	Short	Low	Medium	Low	Definite
VOCs	Low	Site	Short	Very Low	Low	Negligible	Possible
Hydrology and Effluents							
Damage from poor drainage design	Medium	Local	Medium	Low	Medium	Low	Possible
Spills and leaks and poor waste management	Low	Site	Short	Very Low	Low	Negligible	Possible
Localized flooding	Medium	Local	Medium	Low	Medium	Low	Possible
Soils and Geology							
Exploitation of borrow pits	Low	Regional	Medium	Low	Low	Very Low	Definite
Soil Erosion	Medium	Local	Medium	Low	Medium	Low	Likely
Loss of topsoil	Low	Site	Short	Very Low	Medium	Very Low	Likely
Waste Management							
Improper management and disposal of solid / liquid waste	Low	Local	Short	Very Low	Medium	Very Low	Possible
Improper management and disposal of hazardous waste	Low	Local	Medium	Very Low	Medium	Very Low	Possible
Community Health & safety							
Accidents involving workers	Low	Site	Short	Very Low	Medium	Very Low	Possible
Labour and Working Conditions							
Poor management of camp accommodation and living areas	Medium	Site	Short	Very low	Medium	Very Low	Definite
Workers' rights ignored	Low	Site	Short	Very Low	Low	Negligible	Possible
Noise and Vibration							
Construction equipment noise	Low	Local	Short	Very Low	Medium	Very Low	Definite
Construction equipment vibration	Very Low	Site	Short	Very Low	Low	Negligible	Possible



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Potential Impact	Intensity	Extent	Duration	Magnitude	Sensitivity	Significance	Probability
General worksite vibration	Low	Site	Short	Very Low	Medium	Very Low	Possible
General work site noise	Medium	Local	Short	Low	Medium	Low	Definite
Traffic noise	Low	Regional	Short	Very Low	Medium	Very Low	Definite
Traffic Management							
Worker road traffic accidents	Low	Regional	Short	Very Low	Medium	Very Low	Unlikely
Work zone accidents	Low	Site	Short	Very Low	Medium	Very Low	Possible
GBV SEA/SH and Child Labour Management							
Labour influx	Low	Local	Short	Very Low	Low	Negligible	Definite
Child / Forced Labour	High	Local	Short	Low	High	Low	Possible
Gender Based violence, sexual abuse and harassment	High	Local	Short	Low	High	Low	Likely
Access							
Material extraction	Low	Regional	Short	Very Low	Low	Negligible	Definite
Community road traffic accidents	Medium	Regional	Short	Low	Medium	Low	Unlikely
Temporary loss of utility supply	Very Low	Local	Short	Very Low	Low	Negligible	Possible
Wear and degradation of road surface	Low	Regional	Medium	Low	Low	Very Low	Definite
Traffic congestion and delays	Low	Local	Short	Very Low	Medium	Very Low	Definite
Biodiversity							
Encroachment into protected areas	Low	Local	Long	Low	High	Low	Possible
Poaching	Low	Local	Long	Low	High	Low	Possible
Impacts to special status species	Very Low	Local	Long	Very Low	Very High	Low	Unlikely
Invasive Alien Species Introduction	Low	Local	Medium	Very Low	Low	Negligible	Possible
Physical Cultural Heritage							
Chance finds	Low	Site	Short	Very Low	Medium	Low	Unlikely
Known cultural heritage / religious sites	Low	Site	Short	Very Low	Medium	Low	Possible

6.3.1 Air Quality ((Release of exhaust gases, Dust, VOCs)

6.3.1.1 Impacts

267. The general air quality in the area, as evident from the monitoring results (table 4-6, 4-7), is very good. The road rehabilitation will involve earthworks and transporting and dumping of dry material. This will likely lead to an increase in dust in and around the construction zones. This is specifically relevant to those areas within 350m of work zones. This IEE has identified a number of educational facilities (38), health facilities (5) and cultural heritage sites (25) within 350m of the project roads. (table 4-7 in Baseline Environmental conditions).
268. Potential sources of particulate matter emission during construction activities include earthworks, exposed surfaces, exposed storage piles, truck dumping, hauling, vehicle movement on unpaved roads, combustion of liquid fuel in equipment and vehicles, land excavation, and concrete mixing and batching.
269. Vehicles carrying construction material are expected to result in increased SPM levels near the haul roads. This can be of potential importance if the vehicles pass through the areas with a high concentration of sensitive receptors, such as residential areas, in this particular case. At the construction yard, the dust levels are also expected to increase due to unloading of construction materials. The quantity of dust that will be generated on a particular day will depend on the magnitude and nature of activity and the atmospheric conditions prevailing on the day.
270. During construction, the release of combustion gases will mostly be from vehicles transporting materials and equipment to site and potentially from mobile sources such as mobile generators in the construction camp site. These may increase concentrations of atmospheric pollutants (NO_x, PM, CO and SO₂) locally to a limited extent and over a short period especially to the area near the sensitive receptors (see table 4-7 in section 4 of the IEE).
271. Small quantity of fuels, paints, solvents and other volatile substances are likely to be required during the construction phase, which will be stored in secure areas within the construction laydown areas. If not adequately contained, such substances have the potential to result in the dispersion of volatile emissions to the immediate air shed. Given that the storage of such volatile substances will be in small quantities, any potential impacts will be temporary and limited to the immediate surrounding area, likely to be within the Project site or near the construction boundaries. No significant impacts are anticipated.
272. Poor air quality due to the release of contaminants into the work place can result in possible respiratory irritation, discomfort, or illness to workers and human receptors living and working close to construction areas.

6.3.1.2 Mitigation Measures

273. The following mitigation measures will be adopted:
 - Stockpiled soil and sand will be slightly wetted before loading, particularly in windy conditions.
 - Transport through densely populated areas will be avoided.
 - Concrete plants to be controlled in line with statutory requirements and will be not be close to sensitive receptors.

- Most of the excavated material will be used within the project, with minimal cut and fill material to come from outside the site.
- A minimum distance of 300 meters will be ensured between batching plant(s) and the nearest community, educational facility, cultural heritage site and health facility.
- The need for large stockpiles will be minimized by careful planning of material supply from controlled sources. Stockpiles will not be located within 50m of sensitive receptors and shall be covered with tarpaulin when not in use and at the end of the working day. If large stockpiles (>25m³) of crushed materials are necessary, they will be enclosed with side barriers and also covered when not in use.
- The source wise fugitive control measures are provided in Table 6.6.

Table 6-8: Control Measures for Fugitive Dust Emissions

Source	Control Measures
Earth Moving	For any earth moving that is to take place in the immediate vicinity from the site boundary, watering will be conducted as required to prevent visible dust emissions
Disturbed Surface Areas	Apply dust suppression measures frequently to maintain a stabilized surface. Clear vegetation only from areas where work is to commence Use barricading or other measures for windbreaks or wind screens Areas that cannot be stabilized, such as wind driven dust, will have an application of water at least twice a day
Unpaved Roads	Periodicsprinklingonallroadsusedforanyvehiculartrafficatleasttwiceper day during active operations and restrict vehicle speed to 20 kmph.
Storage Piles	Cover material piles with tarpaulin or other means Remove debris and other material every second day, to avoid accumulation of dusty material piles

- Periodically check and conduct maintenance of the construction machinery and haul vehicles.
 - Generators, compressors and vehicles used during construction works will be maintained in a good condition to ensure that emissions are kept to a minimum level.
 - Regularly change the engine oil and use new engines/machinery/equipment having good efficiency and fuel burning characteristics.
 - Controlled technology generators and batching plants will be used to avoid excessive emissions.
 - Burning of wastes at any site will not be allowed.
 - The stack height of generators and asphalt plants will be at least 3 meters above the ground.
 - Training of the technicians and operators of the construction machinery and drivers of the vehicles.
 - All types of vehicles, machinery and generators will comply with the NEQS (see section 2 table 2-3, 2-4) of the IEE report.
 - To control the dust emissions regular water sprinkling (3 time during the cold season and 5 times during hot season) will be carried out by the contractor.
 - Monthly emission monitoring of vehicles, generators and batching plants will be done.
 - Project activities will be planned in a manner so as to avoid harsh weather conditions.
274. Hazardous materials stored and used on site with potential gas emissions (e.g., Volatile Organic Compounds) will be in well-ventilated, but secure low-risk areas, away from major transport routes and away from the site boundary (where possible). Volatile fuels and

chemicals (including hazardous wastes) will be stored in sealed containers. On site storage of large quantities of volatile fuels will be avoided, equally prolonged exposure to direct sun and heat will be avoided. Fires and material burning will not be allowed on the Project site. Chemical storage areas will be purpose built and well maintained. A data log of all chemicals with MSDSs will be provided at the storage facility within easy access.

6.3.1.3 Residual Impact

Table 6-9: Air Quality Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Release of exhaust gases	Negligible	None	None
Dust	Low	Mitigation measures, if applied correctly, will ensure that there any residual impacts are very low. However, some minor dust impacts may occur.	Very low
VOCs	Negligible	None	None

6.3.2 Hydrology and Effluents

6.3.2.1 Impacts

- 275. It is anticipated that a total of 13 camps will be established with more than 3500 number of the staff. The staff and labor camps for the construction of the roads and bridges
- 276. will be a source of wastewater generated from the toilets, washrooms and the kitchen. The quantities of the waste water will be generated around 3-4m³/day from each camp when operating at full occupancy. The wastewater will not meet the national environmental standards and will therefore need treatment prior to disposal.
- 277. Construction waste dumping (intentionally or accidentally) into natural water streams will negatively affect the surface water quality, especially around bridge construction sites where concrete must not be dumped into rivers, or mixers washed out into rivers.
- 278. The project sites where construction is being conducted must not be treated by the project staff and/or labor as a public toilet or for disposal of camp effluent.

6.3.2.2 Mitigation measures

- Labor and construction camps will be located at an optimal distance (500m from any sensitive receptor) from the natural water bodies (Swat river, Kurrum, Kunhar, Chitral rivers, nullah and other streams along bridges and especially for roads such as N-CHT-5, N-CHT-4, RRD-UCH-R1, N-CHT-3, N-CHT-6, N-CHT-7, N-CHT-8, KPR-DIK-NR13, RRD-KRK, R1, RRD-DRL-NR1, RRD-DRU-NR3, RRD-DIK-R1). No construction / non-construction activity will be allowed on the banks of the natural streams and rivers. In the patches where the road and the stream are running parallel, construction will be carried out in close supervision of the Engineer.
- Construction Camps – The Contractor will be responsible for the preparation of a Construction Camp Site Plan which will form part of the SSEMP. The Plan will indicate the system proposed and the locations of related facilities in the site, including latrines,

holding areas, septic tanks, etc. The Contractor will ensure the following conditions are met within the Plan:

- Wastewater arising on the site will be collected, removed from the site via a suitable and properly designed temporary drainage system (fitted with oil and grease interceptor tanks) and disposed of at a location and in a way that will cause neither pollution nor nuisance. A tree fold septic tanks will be established at the camp site, the overflow from the septic tanks will be used for horticultural purposes.
- There will be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies will be prohibited.
- Liquid material storage containment areas will not drain directly to surface water.
- Lubricating and fuel oil spills will be cleaned up immediately and spill clean-up materials will be maintained (including spill kits) across the Contractors construction camp and ancillary facilities, e.g., asphalt plant.
- Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.
- Discharge of sediment-laden construction water directly into surface watercourses or wetlands will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.
- Spill clean-up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage:
 - Fueling operations will occur only within containment areas.
 - All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tanks.
 - Filling and refueling will be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.
 - All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
 - The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any drain or watercourses.
 - Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.
 - Should any accidental spills occur immediate cleanup will be undertaken, and all cleanup materials stored in a secure area for disposal. Disposal of such will be

undertaken by a waste management company contracted by the Contractor. The waste management company must have the required licenses to transport and dispose of hazardous waste before any such waste is removed from the site. The Contractor will keep copies of the company's licenses and provide waste transfer manifests at his camp site for routine inspection by the Engineer.

- Site plans will be devised to ensure that, insofar as possible, all temporary construction facilities are located at least 300 meters away from any surface water course.
- Where applicable, obtain all necessary permits from the relevant authorities for the abstraction of water for construction purposes.
- The Engineer will undertake regular monitoring of the Contractors construction camp and storage areas to ensure compliance with the SSEMP and the Contractors Construction Camp Site Plan. If determined warranted by the Engineer, the Contractor will provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the Contractors camp sites. If so requested, the Contractor will ensure that all vehicles are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor will provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.
- Water supply – Two sources of potable water exist for the Contractors staff; bottled water or groundwater. If groundwater is to be used for drinking it will be tested to ensure that the water quality meets the national drinking water standards. Approximately 200 m³ of technical water will be needed per day during the construction phase and around 15 m³ of potable water per day. The Contractor shall obtain all necessary abstraction permits for both technical and potable water supplies.
- Bridge Construction & Slope Protection works around rivers – the Contractor will:
 - Divert the water flow near the bridge piers.
 - Provide coffer dams, silt fences, sediment barriers or other devices to prevent migration of silt during construction within streams.
 - Perform dewatering and cleaning of cofferdams to prevent siltation by pumping from cofferdams to a settling basin or a containment unit.
 - Carry out construction works without interrupting the traffic on the Project Road with the provision of suitable diversions.
 - Ensure no waste materials are dumped in the river, including re-enforced concrete debris.
 - Place generators more than 20 meters from the river or nullah.
 - Ensure that no concrete sludge waste is dumped in the river or nullah.
 - Carefully collect all polystyrene (from expansion joints) so that it does not litter the local environment.

- Ensure that no hazardous liquids are placed within 10 meters of the river or nullah.
 - Provide portable toilets at bridge construction sites to prevent defecation by workers into the river or nullah.
 - Ensure that workers are provided with correct PPE including harnesses.
 - During piling works ensure that pumped water is filtered through a silt trap before being discharged to the river or nullah.
- Drainage and Flooding – During the construction phase the Contractor will be required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage to properties and land by flooding and silt washed down from the works. The Contractor will arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations. Should any operation being performed by the Contractor interrupt existing irrigation facilities (especially on roads such as RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_R1, RRD_DRU_NR3, RRD_DRU_NR4, KPR_KRK_NR5, RRD_KRK_R1, RRD_KRK_R3), the Contractors will restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption. The Contractor will also be responsible for ensuring that no construction materials or construction waste block existing drainage channels within the Project corridor. The Engineer will be responsible for routine monitoring of drainage channels to ensure they remain free of waste and debris.
 - An emergency preparedness and response plan shall be prepared by the contractor after the award of the contract, supervision consultant will review and approved this plan. This plan will be prepared along with the site-specific environment and safety management plan to be submitted by the contractor.
 - Location of the construction camps will be at areas which are acceptable from environmental, cultural or social point of view.
 - Location of construction camps will be away from communities in order to avoid social conflict with the surrounding communities.
 - Contractor will provide detailed layout plan in the SSEMP which will be approved from supervision consultant and lenders for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps.
 - The Contractor's staff quarters and labour camps will be provided with all necessary services for drainage, lighting, roads, paths, parking places, fencing, sanitation, cook-houses, fire prevention and firefighting equipment.
 - All labour camps, workshops and storage areas will be built on hard compacted ground with sufficient bunding and spill kits so as to prevent the loss or infiltration of leaked or

spilt fluids into surrounding soils, ground water or water courses.

- Traffic signage shall be maintained in the camps. The Contractor will establish a drainage network, including end discharge, to drain storm water away from camps and settlements.

6.3.2.3 Residual Impact

Table 6-10: Hydrology and Effluent Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Damage from poor drainage design	Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	No significant impacts
Spills and leaks and poor waste management	Negligible	None	None
Localized flooding	Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	No significant impacts

6.3.3 Soils and Geology

6.3.3.1 Impacts

279. The works proposed for the roads (such as RRD_DIK_R1, RRD_DIK_R4, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_NR3, RRD_DRU_NR4, KPR_KRK_NR5, RRD_KRK_R1, RRD_KRK_R3) and bridges
280. may result in soil erosion and sedimentation due to their presence near the surface water body. Spoils will be generated from the excavation activities, particularly during construction works. Potential impacts from spoils and their disposal are (i) land for disposal of spoil, (ii) potential erosion from the spoil areas and spoil material reaching the waterways, and (iii) aesthetic impacts.
281. Some roads such as BTG-16, N-BUN-2, N-CHT-2, DRL-35, N-MLK-1, N-MLK-2, SNG-26, SNG-28 SNG-30, T-42, T-22, etc, have undulated and steep slops. The cutting around these roads may have potential impacts and may cause the landslides.
282. During the subproject, spills of fuel, lubricants and chemicals can take place while transferring from one container to another or during refuelling. Also, during maintenance of equipment and vehicles, through leakages from equipment and containers and as a result of traffic accidents.
283. Depending on the nature of the material, location of spill and quantity of spill, the soil can get contaminated.
284. Borrow areas may contaminate with oils and fuel and cause environmental impacts such as water and soils contamination
285. Borrow areas with unplanned pit development may cause landslides in that area, rain water can fill the pits (ponds) which would create breeding grounds of vectors.

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6.3.3.2 Mitigation measures

286. The Contractor, with oversight from the Engineer, will ensure that:

- All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tank (or one tank if more than one tank is in the bund).
- The construction camp maintenance yard will be constructed on impervious hard standing with adequate drainage to collect spills, there will be no vehicle maintenance activities on open ground.
- Filling and refueling will be strictly controlled and subject to formal procedures. Drip pans will be placed under all filling and fueling areas. Waste oils will be stored and disposed of in compliance with Lao PDR regulatory requirements, international best practices or by a licensed contractor.
- All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
- The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any soils.
- No bitumen drums or containers, full or used, will be stored on open ground. They will only be stored on impervious hard standing.

287. Regarding borrow pits. In the first instance, borrow pits that are located within two kilometers of important birds areas (especially for roads such as BN-5, N-CHT-1, N-CHT-4, RRD-LKH-R1, RRD-LKH-R2, RRD-LKH-R4, KOH-BR-24, MAN-BR-75, SNG-BR-80) or within 500 meters of sensitive receptors or urban areas will not be utilized. A due-diligence review will be conducted for all existing borrow pits/quarries proposed for use.

288. A due diligence review will be carried out by the Engineer to confirm that these sites identified for use by the Contractor are indeed operating or operable in an appropriate manner. This will include review of the borrow pits operational license and a site visit to the borrow pits to ensure that sensitive receptors or urban areas are not located within 500 meters of the borrow pits. A copy of the agreement between the operator and the Contractor will also be provided to the Engineer for review.

289. If the Contractor intends to open and operate his own borrow pits, the Contractor will prepare a Borrow Pit Action Plan (BAP) that will be submitted to the Engineer prior to the start of construction. The plan will identify the locations of all proposed borrow pits considering the recommendations of this report and will not be located within two kilometers of a protected area.

290. The locations of the borrow pits will be approved by both the Engineer. The plan will ensure that:

- Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.



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- Arrangements for opening and using material borrow pits will contain enforceable provisions.
 - The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts.
 - Additional borrow pits will not be opened without the restoration of those areas no longer in use.
291. The BAP will also contain the permits and licenses required for the operation of the borrow pits.
292. While operational, the Contractor will ensure that the following conditions are met at his borrow pits:
- Loss of topsoil - Before the materials extraction the layer of top soil (about 20 cm) will be removed to the side of excavation area and kept until the area works will be finalized. Topsoil stockpiles will be located at least 50 meters distance from any watercourses to avoid water siltation and obstruction. The height of stockpiles will not exceed three meters to avoid wind erosion and dust emissions.
 - Fencing – if the Engineer deems the site to be hazardous to the local community (for example a pit could fill with water and people and animals could drown in it) he will request the Contractor to fence the site to prevent access and provide warning signs on the fencing.
 - Soil compaction and disturbance to local flora and fauna species at access roads - The Contractor will take responsibility to provide an access road to the borrow site and all drivers will be instructed to use only this officially designated road. This will help to avoid additional soil compaction and disturbance to the local fauna species.
 - Reinstatement - Full site reinstatement will be undertaken by the Contractor to avoid landscape damage and habitat loss. Rehabilitation measures will include: removing of all types of equipment from the site; removing of all types of waste or/and polluted soil and materials if any exist; slops grade reduction with use of unsuitable stockpiles and uncrushed rocks and; slope stabilization measure such as re-covering with top soil, and further seeding, grassing and planting of appropriate bushes or/and trees if reasonable.
 - Haul Routes - Due to the sensitivity of the borrow pit locations, the Borrow haul routes will follow established transport corridors/rights-of-way, to the extent that is practicable. The routes will be indicated in the Contractors TMP. Haul routes will not pass within protected areas.
293. Erosion - During construction, the Contractor will be responsible for ensuing material that is less susceptible to erosion will be selected for placement around bridges and culverts. In addition, he will ensure re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local grasses and shrubs; (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth. The Engineer and the Contractor

will both be responsible for ensuring that embankments are monitored continuously during construction for signs of erosion.

- 294. Topsoil – To reduce impacts to topsoil the following measures will be employed by the Contractor; locate topsoil stockpiles outside drainage lines and protect stockpiles from erosion; construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil; rip ground surface prior to the spreading of topsoil; and remove unwanted materials from topsoil such as roots of trees, rubble and waste etc. Specifically, regarding soil compaction, the Contractor will confine operation of heavy equipment within the ROW, as much as possible, to avoid soil compaction and damage to privately owned land. If in case private lands are disturbed, the contractor should promptly inform the owner and agree on the ways to remedy the situation.
- 295. Slop protection: Before to start any construction activity at areas where slop cutting involved (especially BTG-16, N-BUN-2, N-CHT-2, DRL-35, N-MLK-1, N-MLK-2, SNG-26, SNG-28 SNG-30, T-42, T-22), the contractor shall submit a work plan which will be approved by the supervision consultants and PIU. The works will only be allowed after approval from PIU. A slop stabilization plan will be prepared before to start of works and approval will be obtained from CSC and PIU.

6.3.3.3 Residual Impact

Table 6-11: Soil and Geology Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Spills and leaks of hazardous liquids	Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant
Exploitation of borrow pits	Very Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant
Soil Erosion	Low	Mitigation measures, if applied correctly, will ensure that there any residual impacts are very low.	Very low
Loss of topsoil	Very Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant

6.4 Traffic Management

- 296. Road construction works are expected to cause traffic disruption and congestion and obstruction of access to roadside properties and establishments. Lack of proper traffic warning signs and other safety measures (e.g., sufficient lighting at night at construction sites, etc.) could cause accidents.
- 297. Transportation of construction materials from outside, phase construction, temporally diversion, loading and unloading of construction materials etc., will increase traffic congestion especially around urban centers, public sensitive locations and construction sites of culverts bridges and causeways. This will negatively impact on the road users and cause delays in travel time, increase noise and exhaust emissions too.

Mitigation Measures

298. Mitigation measures will include:

- In cooperation with the local traffic authorities, properly organize transport of materials for the project to avoid congestion
- Set up clear traffic signal boards and traffic advisory signs at the roads going in and out the road and bridge construction sites to minimize traffic build-up.
- Regularly monitor traffic conditions along access and Project roads to ensure that project vehicles are not causing congestion.
- Provide sufficient lighting at night within and in the vicinity of construction sites.
- Implement suitable safety measures to minimize risk of adverse interactions between construction works and traffic flows through provision of temporary signals or flag controls, adequate lighting, fencing, signage and road diversions.
- Provide temporary accesses to properties and establishments affected by disruption to their permanent accesses.
- Reinstate good quality permanent accesses following completion of construction.
- Provide safe vehicle and pedestrian access around construction areas.
- Provide adequate signage, barriers and flag persons for traffic control.
- If necessary, traffic will be diverted for safe and smooth movement of vehicles to ensure smooth traffic flow and minimize accidents, traffic hold ups and congestion. The diversion signs would be bold and clearly visible particularly at night.
- Temporary bypasses will be constructed and maintained (including dust control) during the construction period particularly at bridge crossings. Location of temporary bypasses shall be agreed with local authorities and such sites shall be reinstated upon completion of works.

6.4.1 Biodiversity and Impacts to Nationally and Internationally Designated Site

6.4.1.1 Impacts

299. The project consists of plain and hilly area. Wildlife occurrence possibility is away from the project site, as there were no siting or other marks of wildlife presence around the project COI during the IEE survey. However, IBAT has indicated that a range of special status species could be present within the Project area, specifically around bridge sites.

300. A few of the proposed roads (such as RRD-LKH-R1, RRD-LKH-R2) and bridges (KOH-BR-24) are located (although at lower altitude) near the internationally designated area, such as Pallas valley (refer to the baseline section) Construction activities and workers could encroach into these areas and impact upon special status flora and fauna. Further, some roads are located close to nationally and internationally designated sites (see table 4.18 in the section 4 Baseline conditions), the risk of encroachment into these areas (such as BN-5, N-CHT-1, N-CHT-4, RRD-LKH-R1, RRD-LKH-R2, RRD-LKH-R4, KOH-BR-24, MAN-BR-75, SNG-BR-80).

- 301. It is also possible that construction camps, plant, and haul / access roads as well as borrow pits and quarries, could be located in these areas.
- 302. Upgrading of the project roads and bridges will generate some additional traffic on the roads, e.g. through promoting access to tourism sites. This could lead to more people accessing the designated sites and potentially affecting site habitat during the construction phase, and for hunting and poaching by workers is a realistic threat, albeit a low one.
- 303. Vegetation will not be significantly affected because all the construction activities are within the available RoW. There is no extensive vegetation removal involved during rehabilitation of roads. No significant tree removal is anticipated, but some trimming or clearing of small shrubs and bushes within the project's right-of-way may be required during the site preparation phase.

6.4.1.2 Mitigation measures

- 304. The following general mitigation measures will be applied
 - General impacts - The works footprint will be reduced as far as possible e.g. through the use of a single vehicle track policies and use of low-impact vehicles where practical. Vehicles will be driven at designated speed limits. Off-road travel will be prohibited where practical. Laydown areas and compounds will be sited to avoid unnecessary clearance of vegetation. All staff will be provided with biodiversity awareness training. Workforce hunting and fishing bans will be enforced and cutting of wood by workers will be prohibited. Fencing will be minimized to ensure that areas vital for wildlife are not isolated by workforce activities, unless this is for species protection measures. Temporary barriers will be used to prevent wildlife from accessing waste disposal areas and similar areas.
 - Tree cutting – No tree cutting in Forest Reserves without explicit permission from District Forest Officers. Any tree cutting will be compensated per national guidelines. Tree re-planting by the Contractor for any tree cut on a 1:10 basis, using species and locations determined between the District Forest Officer and the Contractor.
 - Tree Plantations - Tree plantations on top of embankments and in RoW will serve as small forests and wood lots for the local residents, having tangible benefits in the shape of timber, fuel wood and fodder. Besides soil retention, erosion control and biotic improvements, such plantations will also provide aesthetic and visual screens against sound, dust, wind, toxic emissions, vibrations, night glare and pollution of waterways.
 - Riparian Habitats - Works will be minimized within riparian areas to safeguard aquatic organisms. Crossing points across rivers will be conducted where there is clear access to the banks and vegetation clearance is minimized. Standard pollution control measures will be implemented in all sites (e.g. to prevent silt contamination water will be kept out of the works area using appropriate isolation techniques, such as coffer dams, silt fences and by-pass channels). Camp and storage locations and field activities will be at least 50m from watercourses where practical. Erosion control using 'polders', pads of plants and geo-nets will be implemented. Where trees have to be removed to facilitate the crossing, these will be replanted with a similar species composition.
 - Excavations - Pits and excavations will be filled in as soon as possible following works. Trenches and pits to be created for longer than 48h periods will have 45° ground ramps to allow escape by fauna should they fall in. A pre-start check for fauna will be completed prior to works commencing in the morning if trenches are left open

- overnight. Regular crossing points will be installed to ensure wildlife can cross excavations, berms and drainage channels.
- Non-native / Invasive Species - Native plants that are locally sourced will be used for re-planting. A site wide ban will be placed on workers bringing vegetation or soil from outside the site area to prevent dispersion of non-native invasive species. Minimize topsoil movement.
305. For all roads close to nationally protected areas and internationally designated sites the following conditions will be applied:
- No works will be allowed within the boundary of the protected areas.
 - No access / haul routes will be allowed through the protected areas.
 - No construction camps, batching plants, asphalt plants, borrow pit, quarry, etc, shall be permitted within the protected areas (including plant / pits with existing permits and licenses).
 - The contractor (especially for KOH-BR-24, RRD-LKH-R1, RRD-LKH-R2) and supervision consultants will ensure that the contractor facilities (such as camps, waste disposal points, batching and asphalt plant site) are 500m from any tree clusters, and forest area.
 - It shall be ensured that no nesting (new or old) are disturbed due to any project activities on all roads and especially at KOH-BR-24, RRD-LKH-R1, RRD-LKH-R2
306. During the operational phase the regional government will be responsible for promoting responsible tourism and placing signs adjacent to the respective roads and nationally designated sites informing people of the status of the site and not to encroach into the area without relevant permissions. Important Bird Areas are not nationally designated sites. Public awareness programs to promote the sustainable use of these areas could be developed, but it is also recognised that in all likelihood few people are aware of the status of these sites and their importance for protected bird species. Given the relative remoteness of these roads it may be more appropriate not to promote these areas thereby reducing the potential for poaching and hunting.
307. The following mitigation measures will be adopted by the Contractor to ensure that encroachment into nationally and internationally designated sites does not occur:
- Any area within 50 meters of any park will be fenced off and warning signs erected to ensure that workers are aware of the park boundary and not to enter this area.
 - Works in these areas will be confined to the daylight periods to avoid the requirements for artificial lighting in these areas.
 - Weekly toolbox training to workers operating in the areas adjacent to the designated area throughout the construction period.
 - Daily inspections of the work sites in this area to ensure that there has been no encroachment into the designated area and that all fencing is intact.
 - Any construction litter of waste in the designated area will be removed immediately.
 - No construction camp, asphalt plant, rock crushing plant, concrete batching plant, or laydown area will be allowed within 500 m of the designated area.

308. Special status fish – Contractor will consult with the relevant local environmental protection department to determine the fish spawning periods of the identified special status fish. Contractor will avoid all works in the river during this period. Where practical works shall be undertaken during periods of low flow. A strict ban on fishing by workers shall be enforced.
309. The work on bridges with seasonal flow will start during the dry season to avoid impacts on fish (Table 4.4 shows that 24 of 32 bridges belong to this group). For the remaining 8 bridges, the contractor will consult with the relevant local environmental protection department.
310. Turtles - Prior to works starting, the proposed bridge sites will be surveyed by suitably qualified ecologists to map up-to-date baseline conditions of all bridge sites. The work will focus on the presence / potential presence of notable species, as discussed earlier in this document. It will:
- Employ survey techniques that are fully auditable, repeatable and in line with good practice guidance and undertaken by a suitably qualified professional.
 - Be conducted at a suitable time of year for the target habitats and species.
311. Based on the findings of the surveys a turtle management plan will be prepared for each bridge where specific risks have been identified. The management plan will include requirements for daily inspections of bridge sites prior to the commencement of works to identify and remove turtles from work zones in accordance with the plan. Eating or selling of the turtles by workers will be a sackable offence.
312. The contractor (especially for KOH-BR-24, RRD-LKH-R1, RRD-LKH-R2) and supervision consultants will ensure that the contractor facilities (such as camps, waste disposal points, batching and asphalt plant site) are 500m from any tree clusters, and forest area.
313. No hunting, poaching and caging of the birds will be allowed for all project roads and bridges especially for KOH-BR-24, RRD-LKH-R1, RRD-LKH-R2.
314. It shall be ensured that no nesting (new or old) are disturbed due to any project activities on all roads and especially at KOH-BR-24, RRD-LKH-R1, RRD-LKH-R2

Mitigation Measures for Pallas Area

- Hunting and poaching of species will be completely banned within important bird areas and the offenders will be heavily fined and punished for such an offence.
- Enabling and construction works will be carried out in the pre-determined RoW so that all unnecessary habitat loss or degradation is avoided.
- During the construction phases of the road network, the working schedule will be planned and the speed limit will be placed on the service roads.
- Materials brought for road construction will be placed in unused places or away from the water sources as much as possible.
- Materials released during road construction will be quickly removed from the area by selecting suitable areas outside the site.
- As a part of road construction and maintenance repair activities, cleared areas will be restored to their natural state.

- Along with existing road networks, areas where natural vegetation is bare or badly degraded, as well as areas used to obtain road construction materials, will be re-planted with species suitable for the region.
- Fencing practices must be ensured to minimize the risk of deterioration of the area during road network construction.
- Construction vehicles, equipment and machinery will remain confined within their designated areas of movement.
- Suitable and well-maintained equipment will be used.
- Noise pollution reduction will be planned to protect wild animals and their acoustic environment before road construction.
- Materials leaving the construction site shall be transported during non-peak hours in order to minimize traffic noise due to the increase in traffic volumes
- Native, locally sourced plants or seeds will be used for habitat restoration and there will be a ban on workers bringing vegetation or soil from outside the site area to prevent dispersion of non-native invasive species. Wash down of all vehicles and equipment will be mandatory and the Environmental Specialist (contractor) will be responsible for identifying and removing any invasive species.
- Areas where vegetation has been temporarily cleared will be restored to as close to their original condition as possible, as long as this is consistent with safety and visibility for road traffic
- Seeds for restoration will be gathered from the local vegetation.
- The Project will also ensure all construction workers are also banned from the killing of any snakes or other reptiles.
- If snakes are discovered on sight, they will be left alone and allowed to disperse. The designed in animal crossings and culverts will also be suitable for some reptiles and help reduce some unnecessary mortality.
- Animal corridors must be provided along the whole alignment and specially in vicinity of fauna species areas wherever necessary.
- Inform construction and operation staff (including contractors) on the habitats of conservation value and protected critically endangered, endangered, and vulnerable plant and animal species.
- Socialization programme with local villages to promote awareness of importance of habitats of birds and plant species of important value.
- Clear demarcation of areas to be cleared during construction.
- Prevent and reduce hunting and logging in areas opened through the creation of new or improved access roads.
- Prevent and reduce mortality of wildlife from collision from vehicles.
- Light control within Project Area to minimize disturbance to species.
- Methodical clearance of forested areas under ecological supervision.

- Using no-noise or lay noise construction machines, no construction activity from dusk to dawn.

6.4.1.3 Residual Impact

Table 6-12: Biodiversity Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
General construction impacts	Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant
Encroachment into protected areas	Low	Mitigation measures, if applied correctly, will ensure that there any residual impacts are very low.	Very low
Poaching	Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant
Impacts to special status species	Low	Mitigation measures, if applied correctly, will ensure that there any residual impacts are very low.	Very low
Invasive Alien Species Introduction	Negligible	None	None

6.4.2 Community Health & safety

6.4.2.1 Impacts

315. The roads rehabilitation will involve the use of considerable heavy machinery at the project site. Trenches and excavation sites could pose trip and fall risks to commuters and nearby communities, especially during night hours and rainy conditions. In addition, material piles on the road as well as parking of the construction vehicles and machinery along the under-construction road will pose significant risks. The number of people living close to roads in low, but there are also a number of schools within 350m of the project roads. Community Health & Safety may be compromised during road travel particularly in night hours if adequate barriers and lighting is not provided at construction sites. Thus, a number of precautionary measures will be necessary to minimize the risk of possible accidents.

6.4.2.2 Mitigation Measures

316. The following mitigation measures will be implemented:

- Work areas within and outside the project sites, especially where machinery is involved, will be barricaded and will be constantly monitored to ensure that local residents, particularly children stay away while excavated areas are being prepared for road. Road related infrastructure will be cordoned off. Also, no machinery will be left unattended, particularly in running condition.
- Local communities in the project area will be briefed on traffic safety.
- Proper and adequate nighttime lighting will be provided at the construction sites, including warning lights for traffic.
- Proper signage and reflectors will be installed at appropriate locations.

- Proper signage and reflectors will be installed at appropriate locations.
- Speed limit of 20 km/hr will be maintained by all project related vehicles and nighttime driving of project vehicles will be limited where possible.
- The contractor will prepare a site-specific traffic management plan before the start of the work and will get it approved by the site safety in-charge of consultant and resident engineer.
- Educate drivers on safe driving practices to minimize accidents and to prevent spillover of hazardous substances and other construction materials during transport.
- Contractor will take proper safety measures (placing warning tapes around excavations) to avoid people, especially children, accidentally falling into excavations.
- All the working platforms will be cordoned off with special care by well-trained skilled workers.
- Contractor will prepare a construction management plan before the mobilization at site and within 15 days after the award of the contract. This plan will also include the hazard prevention and safety plan, which will address health and safety of the people in the project area.
- PIU will ensure the contractor staff working in the project are well trained and educated in the Health, Safety and Environment (HSE) hazards associated with their duties, and that of the public, in the project area.
- Awareness about roads related current and potential environmental threats for the public at large and roadside dwellers, in particular, requires due attention; the aspect neglected in the past. Enhanced education in road related environmental issues and awareness raising can be achieved through campaigns by; Visual graphics, Print media, Seminars & workshops.
- Wherever possible, PIU along with Social and environment expert of CSC must involve local communities, for contractors' camp locations, resource sharing with construction workers and their choice of tree species. In this way a sense of ownership will be inculcated in local residents who will also protect core roads and its related resources. The past practices of isolated working methodology must transform into a participatory mode.

6.4.2.3 Residual Impact

Table 6-13: Community Health and Safety Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Community road traffic accidents	Low	Mitigation measures, if applied correctly, will ensure that there any residual impacts are very low.	Very low

6.4.3 Labour and Working Conditions

6.4.3.1 Impacts

317. There is invariably an OHS risk when construction works for the road are conducted, and precautions will be needed to ensure the safety of the workers.

318. The major OHS hazards expected during the proposed activities are as follows:

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- Falls from height, especially when standing/ working on ladders;
 - Slips, trips and falls, especially while carrying heavy or bulky loads;
 - Cuts and injuries caused by sharp instruments and tools;
 - Injury or death can occur from being trapped, entangled, or struck by machinery parts due to unexpected starting of equipment or unobvious movement during operations;
 - Psychological stress due to dissatisfaction at work due to issues with peers, superiors etc.;
 - Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords and hand tools, can pose a serious risk to workers.
 - Overhead wires can be struck by metal devices, such as poles or ladders, and by vehicles with metal booms. Vehicles or grounded metal objects brought into close proximity with overhead wires can result in arcing between the wires and the object, without actual contact.
 - Welding creates an extremely bright and intense light that may seriously injure a worker's eyesight. In extreme cases, blindness may result. Additionally, welding may produce noxious fumes to which prolonged exposure can cause serious chronic diseases (this is in case of steel bridges).
 - Work in confined spaces (bridges and culverts);
 - Exposure to natural hazards and extreme weather conditions.
 - The contractor will prepare Occupational Health and Safety Plan along with the construction environment and social management plan within 15-days from the award of the contract.
319. Labor influx issues can be particularly acute because the project is likely to result in smaller communities hosting a largely male workforce (a potential scenario during the rehabilitation of the subproject), and/or a workforce from other regions which may result in conflicts between locals and non-locals concerning employment opportunities, wages, and natural resources. Mobile workers can also contribute significantly to gender-based social impacts and risks. The following summarises key risks associated with labour influx.
320. **Risk of social conflict:** Conflicts may arise between the local community and the construction workers, which may be related to religious, cultural or ethnic differences, or based on competition for local resources. Tensions may also arise between different groups within the labor force, and pre-existing conflicts in the local community may be exacerbated. Ethnic and regional conflicts may be aggravated if workers from one group are moving into the territory of the other.
321. **Increased risk of illicit behavior and crime:** The influx of workers and service providers into communities may increase the rate of crimes and/or a perception of insecurity by the local community. Such illicit behavior or crimes can include theft, physical assaults, substance abuse, prostitution and human trafficking.
322. **Increased burden on and competition for public service provision:** Presence of construction workers and service providers (and in some cases family members of either or both) can generate additional demand for the provision of public services, such as water, electricity, medical services, transport, etc.
323. **Increased risk of communicable diseases:** The influx of people may bring communicable diseases to the project area, including sexually transmitted diseases (STDs), or the incoming workers may be exposed to diseases to which they have low

resistance. Workers with health concerns relating to substance abuse, mental issues or STDs may not wish to visit the project’s medical facility and instead go anonymously to local medical providers, thereby placing further stress on local resources. Local health and rescue facilities may also be overwhelmed and/or ill- equipped to address the industrial accidents that can occur in a large construction site.

324. Project activities, particularly in the case of third-party contractors, may involve the use of forced labor, which is defined as any work or service that is obtained from an individual under threat of force or penalty. This includes indentured labor, bonded labor, and trafficked persons. There is also a risk that child labor may be used by third-party contractors. These risks are likely to be higher in economically disadvantaged and remote areas of the province.

6.4.3.2 Mitigation Measures

325. The Contractor will be required to implement an effective Occupational Health and Safety (OHS) Plan that is supported by trained first aid personnel and emergency response facilities. Construction contracts will include standard Occupational Health and Safety measures and contractors will be bound to implement these fully. The OHS Plan will be fully aligned with the OHS Improvement Plan for Transport Sector OHS and Hazard Specific Guidelines & Critical Controls.

326. Monitoring will be carried out to ensure that the health and safety plan based on contract specifications is followed.

- Cement feed hopper areas will be inspected daily to ensure compliance with the requirement of dust masks.
- Surfaces (including flooring and work surfaces) in camps, kitchens, dining areas and workshops will be solid and easy to clean.
- All drivers engaged by Contractor will hold a valid license for the vehicle they are operating.
- Work in confined space (i.e. under the culverts, existing’s bridges, drains also where the scaffoldings is being used) shall be executed with available safety standards. Adequate monitoring and equipment shall be available to detect deficient oxygen levels.
- The Contractor shall submit to the Engineer of CSC for approval an emergency evacuation plan.
- The Contractor shall submit to the Engineer of CSC for approval a site layout plan, identifying work areas, accommodation, kitchen, dining area, sanitary facilities, location of generators, plant and vehicle parking, transport routes through the camp, pedestrian routes through the camp, evacuation routes, emergency exits, batching plants, storage areas, waste facilities etc.
- Fire extinguishers will be provided throughout camps and work sites. Fire extinguishers will be inspected monthly and maintained as necessary.
- An adequate and reliable supply of safe drinking water shall be made available at readily accessible and suitable places including at all camps.
- The Contractor shall take samples of drinking water monthly and arrange for analysis of these samples at KP EPA certified laboratory. The results of these test will be submitted to the Engineer of CSC and must demonstrate that the water meets national and World Health Organization (WHO) standards for drinking water.

- The Contractor shall provide and maintain adequate hygienic kitchens which are sheltered and separated from the living quarters. Kitchens shall include raised and washable surfaces suitable for food preparation.
- The Contractor shall provide and maintain adequate hygienic dining areas for staff. Workplaces and camps will be provided with both natural and artificial light. Artificial lighting will be powered by solar panels / generators in the event of power cuts.
- All OHS protocols will be implemented in true letter and spirit.
- Contractor will appoint an OHS resource to implement, monitor and report the HSE management plan to concerned authorities.
- Contractor will ensure the provision of a reasonable number of first aid kits and first aid facilities at construction sites and camps through hiring medics and establishing a dispensary at the campsite.
- Site personnel will be provided appropriate types of personal protective equipment (PPEs). Contractor will ensure consistent use of PPEs.
- Based on the type of hazard applicable during the proposed works at site, the following mitigation measures as per IFC guidelines for Occupational Health and Safety (OH&S) will be implemented:
 - Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment will be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point.
 - Turning off, disconnecting, isolating, and de-energizing (Locked Out and Tagged Out) machinery with exposed or guarded moving parts, or in which energy can be stored (e.g. compressed air, electrical components) during servicing or maintenance.
 - Installing equipment, where feasible, to enable routine service, such as lubrication, without removal of the guarding devices or mechanisms.
 - Marking all energized electrical devices and lines with warning signs;
 - Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools;
 - Double insulating / grounding all electrical equipment used in environments that are, or may become, wet;
 - using equipment with ground fault interrupter (GFI) protected circuits;
 - Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas;
 - Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work.
 - Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific workstation (a solid piece of light metal, canvas, or plywood designed to block welding light from others).
 - Special hot work and fire prevention precautions and Standard Operating Procedures (SOPs) will be implemented for welding or hot cutting outside established welding work stations, including 'Hot Work Permits, stand-by fire extinguishers, stand-by fire watch, and maintaining the fire watch for up to one hour after welding or hot cutting has terminated.

- Fuel storage areas and generators will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area will be equal to 120% of the total volume of fuel stored.
- Storing flammables away from ignition sources and oxidizing materials. Flammables storage area will be:
 - Remote from entry and exit points into camps
 - Away from facility ventilation in takes or vents
 - Have natural or passive floor and ceiling level ventilation and explosion venting
 - Use spark-proof fixtures
 - Be equipped with fire extinguishing devices and self-closing doors, and constructed of materials made to with stand flame impingement for a moderate period of time.
 - Defining and labeling fire hazards areas to warn of special rules (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment).
 - Providing specific worker training in handling of flammable materials, and in fire prevention or suppression.
 - Workers who are required to handle chemicals will be provided with specialized training and provided with, and wear, appropriate PPE (gloves, apron, splash suits, face shield or goggles, etc).
 - Working schedules will be developed and maintained to avoid long exposure to harsh weather conditions.
 - Construction workers will be provided training on Emergency Preparedness and Response Plan to respond to any natural hazards.
 - Obligatory insurance against accidents for laborers/workers;
 - Providing basic medical training to specified work staff and basic medical service and supplies to workers;
 - Layout plan for campsite, indicating safety measures taken by the contractor, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing and contingency measures in case of accidents;
 - Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for laborers;
 - Provision of adequate sanitation, washing, cooking and dormitory facilities including light up to satisfaction;
 - Provision of appropriate PPEs to workers, e.g. helmet, adequate footwear for bituminous pavement works, protective goggles, gloves, earmuffs etc.;
 - Ensure strict use of wearing these protective clothing during work activities;
 - Elaboration of a contingency planning in case of major accidents;
 - Adequate signage, lightning devices, barriers, yellow tape and persons with flags during construction to manage traffic at construction sites, haulage and access roads.
 - Implementation of labor management procedure and plan already prepared and disclosed for the project.

327. For activities around bridges and water courses, the following shall apply:

- Development of the appropriate construction method.



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- The provision of the life jackets and personal floatation devices (for working in water)
- Workers may be designated to perform the rescue tasks
- Workers are informed about appropriate rescue procedures
- workers are trained in rescue procedures and use of rescue equipment
- workers may need to be trained in cardiopulmonary resuscitation (CPR) and first aid
- As part of the site specific EMP, the contractor will prepare, obtain approval of, and implement an occupational health and safety (OHS) plan. OHS Plan will contain general guidance for all identified hazards under each work activities, and site-specific OHS hazard and risks during construction, and control and preventive measures. The Plan shall be reviewed and updated if there any changes in the construction methodologies.
- Conduct 'job hazard analysis' at the bridge rehabilitation / construction site to identify potential hazards that may arise from the proposed works or working conditions to the project workers and implement necessary control measures. The job hazard analysis will be part of the contractor's method statements, which will be reviewed and approved by the OHS Specialists of the supervision consultants. The specialists will also visit the construction sites prior to the start of construction to ensure the control measures are in place.
- Regular site inspections and safety audits by the construction supervision team, both by the OHS specialists and the site engineers. Site engineers will be trained by their OHS team on monitoring the safety aspects of the construction works.
- All workers will wear life vests when working near and over water.
- Regular training program for workers on occupational health safety (monthly training and daily toolbox talks). Special attention will be focused on the use of life vests, ring buoys, hazard awareness, and emergency response plan.
- Incident investigation and reporting, including a complete record of accidents and near misses, will be maintained.
- Availability of firefighting, ambulance, medical and rescue facilities at the site for implementation of an emergency response plan
- Contractors will have dedicated and qualified staff for ensuring compliance with the OHS Plan.
- Awareness-raising material will be used, including posters, signage, booklets, and others at the worksites.

328. With regards to worker conduct and behavior, the following shall be applied:

- Local population will be given preference in construction related jobs. Most unskilled workers will be hired from local communities, while for skilled manpower also, first choice will be given to local area residents.
- The Contractor will prepare the construction camp management plan which, in addition to other components, will include the labor influx management plan. This will be reviewed and approved by CSC.
- The Contractor will select specific timings for the construction activities particularly near the settlements, so as to cause least disturbance to the local population, particularly women.
- Contractor will take due care of the local community and observe sanctity of local customs and traditions by his staff. A Workers Code of Conduct will be developed and

strictly implemented, which will warn the staff strictly not to involve in any unethical activities and to obey the local norms and cultural restrictions.

- During construction activities, if privacy of the nearby households is affected, the Contractor will inform the house owner to make some arrangements. Similarly, Contractor will take care as much as possible that the construction activities should not affect the privacy.
- The contract will explore alternative water sources and ensure that water usage by the project does not affect or compete with water requirements of the local community.
- The Contractor will also ensure that noise and light pollution from the labor camp is kept at minimal levels especially at night.
- The labor camp will be 500m away from any residential dwellings.
- Regular medical checkup of workers for communicable diseases.
- Fencing of labor camp.
- STD control and management plan will be prepared by the contractor and the same will be implemented with letter and spirit.
- SEA/SH related complaints received through the GRM will have dedicated staff trained on handling and responding to GBV/SEA/SH cases in survivor-centric approach.

329. To mitigate the potential for forced/child labour the Contractors will prepare a labour management plan (LMP) will include details on mitigating the risk of child labor and forced labor. Contractors will be prohibited from hiring children below the age of 15 for any type of labor, and below the age of 18 for hazardous work. Project staff will monitor sites to check for child labor

6.4.3.3 Residual Impact

Table 6-14: Labour and Working Conditions Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Worker road traffic accidents	Very Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant
Work zone accidents	Low	Mitigation measures, if applied correctly, will ensure that worker accident risk is minimized.	Very low
Labour influx	Negligible	None	None
Child / Forced Labour	Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant

6.4.4 GBV and SEA/SH

330. Gender-based violence, sexual exploitation and abuse, and sexual harassment risks are likely throughout the duration of the project. These may stem from contact between local communities and project workers for the implementation of project. Labor influx may also trigger and exacerbate these risks. The SEA/SH risks level for the project has been taken as substantial.

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- 331. Increased worker wages in the project areas as a result of employment opportunities generated by the project may lead to an increase in transactional sex and sexual exploitation of vulnerable individuals in the community.
- 332. Female project staff may also be at risk of GBV and SEA/SH, especially those working on field assignments in remote and hard to reach areas.

6.4.4.1 Mitigation:

- A Gender Action Plan will be developed and implemented, and systems will be set up to work with the project GRM to address any GBV, SEA/SH related complaints.
- The GRM will be equipped with dedicated staff trained to handle and respond to GBV/SEA/SH complaints in a survivor-centered manner
- Orientation on GBV/SEA/SH to the project staff and workers
- Awareness on GBV/SEA/SH to community members
- Mapping of GBV service providers

6.4.4.2 Residual Impact

Table 6-15: GBV SEA/SH Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Gender Based violence, sexual abuse and harassment	Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant

Child Labour and Protection:

Impacts

- 333. Child labor refers to work that is dangerous, excessive, or harmful to children, including mental and physical well-being. According to UNICEF, many child laborers are subjected to long working hours, hazardous working environments, physical injuries, and mental, emotional and developmental health impacts making even them more vulnerable to trafficking and abuse.
- 334. In addition to jeopardizing children’s health, safety and development, child labor can have long-term impacts on families and communities. According to the ILO, more than 25% of children aged 5 to 11 and over 33% of children aged 12 to 14 who are in child labor do not go to school. By disrupting or ending schooling, child labor limits future work and economic opportunities, increasing income inequality over generations.
- 335. Child labor is on the rise across the country due to deteriorated economic conditions. Workforce shortages, migration patterns (including the increasing presence of undocumented workers)
- 336. Due to poverty in the project areas, child labour is anticipated especially in rehabilitation of roads.
- 337. Mitigations:

- No child labour (under 18 years) will be allowed at all sites of roads and bridges rehabilitation works.
- The labour record will be available where in special focus will be given on the age of the worker.
- All worker will be allowed only once the CSC will check the appointment record of permanent and daily wages workers.
- In case any case reported for child labor the CSC will immediately report to the PIU and the child will be protected as per all human rights rules prevailing in the province.
- Child labour will be reported immediately to the concerned labour department and child will be transferred to the child rehabilitation

6.4.5 Noise and Vibration

6.4.5.1 Impacts

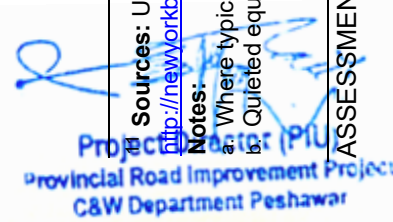
338. The roads rehabilitation will result in different construction equipment and machinery being used which will generate high noise levels at the project site and in the project area.
- The construction activities will include use of a large number of trucks, generators, excavators, and other construction equipment etc., which can generate significant noise.
 - Due to peculiar site conditions in terms of hard rock where hammering may be required.
 - Depending on the construction equipment used and its distance from the receptors, the community and the workers may typically be exposed to intermittent and variable noise levels. During the day, such noise results in general annoyance and can interfere with sleep during the night.
 - Due to the various construction activities, there will be temporary noise impacts in the immediate vicinity of the project site. The movement of heavy vehicles, loading, transportation and unloading of construction materials produces significant noise during the construction stage. However, these increased noise levels will prevail only for a short duration during the construction phase.

Table 6-16: Construction Equipment Noise Ranges, dB(A)¹¹

Equipment	Peak Noise Range at 15 m	Typical Peak Sound Level in a Work Cycle at 15 m	Typical 'Quieted Equipment' Sound Level at 15 m	Construction Phase		
				Earthworks	Structures	Installation
Batching plant	82-86	84	81		Y	
Concrete mixers	76-92	85	82		Y	
Cranes	70-94	83	80		Y	Y
Excavators	74-92	85	82	Y		
Front loader	77-94	85	82	Y	Y	Y
Water browsers	85-93	88	85	Y	Y	Y
Graders	72-92	85	82	Y		
Bulldozers	65-95	85	80	Y		
Pavers	87-89	88	80	Y		
Pumps	68-72	76	75	Y	Y	Y
Diesel generators	72-82	81	77		Y	Y
Drilling machines	82-98	90	87		Y	Y
Compressors	74-88	81	71		Y	
Dumpers	77-96	88	83	Y	Y	
Dump/flatbed Truck	75-85	80	77	Y	Y	Y

1. Precise information on the type, quantity and location of equipment to be used during the construction phase is not available at this stage and will be dependent on the working methods of the selected contractors. However, preliminary calculations have been conducted to provide a general magnitude of the noise levels during various construction phases.

2. Furthermore, no equipment which is generating high noise levels will be permitted to work at site. Moreover, equipment's and machineries noise shall be reduced to minimum after 100-150 meters.



Sources: USEPA, 1971; <http://www.waterrights.ca.gov/EIRD/text/Ch11-Noise.pdf>; http://www.lacsd.org/LWRP%202020%20Facilities%20Plan%20DEIR/4_6_Noise.pdf; <http://newyorkbiz.com/DSEIS/CH18Construction.pdf>

Notes:

- a. Where typical value is not cited in literature, mean of the peak noise range is assumed
- b. Quieted equipment can be designed with enclosures, mufflers, or other noise-reducing features. Where data is not available, a 3 dB reduction is assumed

6.4.5.2 Mitigation Measures

339. The following mitigation measures will be implemented:

- Equipment noise will be reduced at source by proper design, maintenance and repair of construction machinery and equipment. Noise from vehicles and power generators will be minimized by use of proper silencers and mufflers.
- Excessive noise emitting equipment will not be allowed to operate and will be replaced.
- Blowing of horns will be prohibited on access roads to worksites.
- In case blasting is required, only controlled blasting will be employed, with adequate prior intimation to nearby communities.
- As a rule, the operation of heavy equipment shall be conducted in daylight hours.
- Well-maintained haulage trucks will be used with speed controls.
- Use of ear plug and ear muffs will be ensured during construction. No employee will be exposed to a noise level greater than 85 dB (A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear will be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).
- Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls will be investigated and implemented, where feasible.
- Periodic medical hearing checks will be performed on workers exposed to high noise levels.
- All the equipment and machinery used during the construction phase will be proactively maintained in compliance with NEQS.
- Grievance redress mechanism will be established for workers and community.
- Exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, will be controlled through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure.
- No equipment and machinery with loose or vibratory parts will be allowed to work. Use of rollers for land grading will be carried out during day times and with intermittent intervals to reduce the impacts of vibration on the surrounding environment.
- Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and workdays will be limited to less noise-sensitive times. Hours-of-work will be approved by the Engineer having due regard for possible noise disturbance to the residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential areas, medical facilities, educational facilities, and religious temples the Contractor's hours of working will be limited to 8 AM to 6 PM. During religious holidays the Contractor will not work within 250 meters of any temple.
- Community Awareness, i.e., public notification of construction operations will incorporate noise considerations.

6.4.5.3 Residual Impact

Table 6-17: Noise and Vibration Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Construction equipment noise	Very Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant
General work site noise	Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant
Construction equipment vibration	Very Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant
General worksite vibration	Very Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant

6.4.6 Waste Management

6.4.6.1 Impacts

- 340. During construction/civil works potential sources of waste will include spoils generated during road excavation, excavation waste for other civil works, domestic wastes (solid & wastewater), fuel or oil leakages or spills, onsite effluents from vehicle washing and cleaning, and cement spills.
- 341. Disposal of waste materials containing contents of both hazardous and non- hazardous nature such as scrap wood, bricks, concrete, asphalt, plumbing fixtures, piping, insulation (asbestos and non-asbestos), metal scraps, oil, electrical wiring and components, chemicals, paints, solvents etc. can potentially become a serious environmental issue, particularly with the local contractors.
- 342. Domestic wastes generated during construction of road will include sewage, gray water (from kitchen, laundry, and showers), kitchen wastes, combustible wastes and recyclable wastes from contractor camps. It is estimated that around 150kg/day of waste will be generated from each construction camp.

6.4.6.2 Mitigation measures

- The contractors will be required to prepare a waste management plan for the site in light of guidelines provided in the EMP and submit to PIU for approval. This plan will cater to sorting of hazardous and non-hazardous materials prior to disposal, placing of waste bins at the project sites for waste disposal and an onsite hazardous waste storage facility i.e. designated area with secondary containment.
- No asphalt plant working on the old principles involving Asbestos will be employed for the subproject.
- Construction waste and debris, after sorting and removing any hazardous content, could be used for the leveling of surfaces and other construction activities outside of the subproject. Such waste will be offered to other contractors working on other Government construction works or nearby communities. If any party is interested in acquiring this material and reusing it, the same will be offered at no cost, provided they transport it themselves.

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- Licensed waste contractors will be engaged to dispose of all non-hazardous waste material that cannot be recycled or reused.
- All types of combustible and non-combustible waste including plastic or glass bottles and cans will be temporarily stored at designated places.
- Waste management training for all site staff to be included in Contractor’s waste management plan
- Fuel storage areas and generators will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area should be equal to 120% of the total volume of fuel stored.
- Fuel and hazardous material storage points will be included in the camp layout plan to be submitted for approval. Hazardous material storage areas shall include a concrete floor to prevent soil contamination in case of leaks or spills. Fuel tanks will be checked daily for leaks and all such leaks will be plugged immediately.
- Designated vehicles and refueling points will be included in the camp layout plan to be submitted for approval.
- Hazardous waste will be initially stored on site at designated areas and then handed over to EPA certified contractors for final disposal.
- Record of waste generation and transfer shall be maintained by project contractors.
- Spill kits, including sand buckets (or other absorbent material) and shovels must be provided at each designated location.
- At the time of restoration, septic tanks will be dismantled and backfilled with at least 1m of soil cover keeping in view the landscape of the surrounding natural surface.
- It will be ensured that after restoration activities, the campsite is clean and that no refuse has been left behind.
- Clinical wastes will be temporarily stored onsite separately and will be handed over to approved waste contractors for final disposal.
- Training will be provided to personnel for identification, segregation and management of waste.

6.4.6.3 Residual Impact

Table 6-18: Waste Management Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Improper management and disposal of solid / liquid waste	Very Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant
Improper management and disposal of hazardous waste	Very Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant

6.4.7 Physical Cultural Heritage

343. No historical/archaeological sites have been found within the RoW.

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344. However, several sensitive receptors (schools and mosques) have been identified at a distance of 350 of some of the roads (See table 4-9 of baseline conditions).

6.4.7.1 Mitigation measures

345. The Contractor will prepare a chance find procedure. The procedure will incorporate all of the requirements of the GoKP regarding chance finds.

346. In the case of a chance find, the contractor will secure the site and report immediately to Supervision Consultant and PIU

347. The following ‘chance-find’ principles will be implemented by the contractor throughout the construction works to account for any undiscovered items identified during construction works at all roads and bridges sites:

(i) in case some heritage found during the construction, the workers will be trained in the location of heritage zones within the construction areas and in the identification of potential items of heritage significance.

(ii) Should any potential items be located, the site supervisor will be immediately contacted and work will be temporarily stopped in that area.

(iii) If the site supervisor determines that the item is of potential significance, an officer from the department of Archaeology (DoA) will be invited to inspect the site and work will be stopped until DoA has responded to this invitation.

(iv) Work will not re-commence in this location until agreement has been reached between DoA and proponent as to any required mitigation measures, which may include excavation and recovery of the item.

(v) A precautionary approach will be adopted in the application of these procedures.

6.4.7.2 Residual Impact

Table 6-19: Cultural Heritage Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Chance finds	Very Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant
Known cultural heritage / religious sites	Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant

6.4.8 Access

348. During the construction phase of the project, the closure of existing unpaved / deteriorated road and other pathways will cause inconvenience to the nearby residents and affect their daily life activities especially in areas where population density is relatively high. It might be difficult for the students to reach their school/colleges. Similarly, the patients may also face difficulty of access to the basic health unit and hospital. However, population is generally low along the roads and therefore low numbers of people are likely to be affected.

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6.4.8.1 Mitigation Measures:

- 349. Mitigation measures will include public awareness through media, proper traffic diversion plans, appropriate sign boards and timely completion of the project.
- 350. For specific receptors, especially sensitive receptors, alternate temporary access will be provided for foot-traffic. Also, people taking their animals to grazing grounds in this area might face accessibility issues.
- 351. Mitigation measures will include public awareness through media, proper traffic diversion plans, appropriate sign boards and timely completion of the subproject.
- 352. The rehabilitation work will be carried out in batches; next batch will only start once the previous batch is done. This will ensure that not the entire road becomes impassable at any given time. This activity will be adopted for all roads.

6.4.8.2 Residual Impact

Table 6-20: Access Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Reduced access to homes, businesses, schools etc.	Low	Mitigation measures, if applied correctly, will ensure that there are no significant residual impacts.	Not significant

6.5 Operation Phase

- 353. The ‘activity wise’ screening of potential impacts during the operation phase is provided in Table 6.6 while details are given in subsequent paragraphs.

Table 6-21: Activity Wise, Screening of Impacts during Operation Phase

Potential Impact	Intensity	Extent	Duration	Magnitude	Sensitivity	Significance	Probability
Release of exhaust gases	Low	Local	Long term	Low	Medium	Low	Definite
Dust	Low	Local	Long term	Low	Medium	Low	Possible
Waste management	Low	Site	Long term	Very Low	Low	Negligible	Possible
Traffic noise and vibration	Low	Local	Long term	Low	Medium	Low	Definite
Road traffic accidents	Low	Site	Long term	Very Low	High	Low	Possible
Economic impacts	Medium	Regional	Long term	High	Medium	High	Definite

6.5.1 Air Quality

6.5.1.1 Impact

- 354. According to the road traffic assessment, traffic is anticipated to increase due to improvement in Vehicle Operating Cost and better road conditions once the project becomes operational. The main source of air pollution during the operational phase will

be vehicles moving on this road. The main pollutants are Carbon monoxide (CO), Nitrogen oxides (NOx), Sulphur dioxide (SO₂) and Particulate matter (PM). Noise levels may also increase due to increased number of vehicles of the road.

355. However, considering that the project road is located in a rural area where the traffic is expected to largely remain thin even after increase post subproject, this impact is considered as of low significance. Furthermore, the improved road condition is likely to reduce the air pollution from the existing routine traffic through more even flow of traffic and less dust from unmade/degraded surfaces.

356. There will be no vibration impacts during the operational phase of the Project.

6.5.1.2 Mitigation measure

- Tree plantation in the area will be carried out by the PIU. As per KP Forest general tree plantation rule, 100 trees per kilometer will be planted as part of tree plantation initiative. PIU will coordinate with the Forest Department for location of tree plantation. As part of trees plantation campaign around 196000 trees will be planted with the consultation of the forest department. The tree plantation plan will be developed by the CSC and PIU with consultation of KP forest department and will be approved by the ADB before the operation phase of the project. The cost of tree plantation has been allocated in the EMP implementation cost.
- Comprehensive Operational and Maintenance Rules as per ISO standards should be prepared and implemented by the C&W.
- Strict application of traffic rules and regulations, including those about the fitness of vehicles
- Regular maintenance of engineering works of road.
- Regular road maintenance to ensure good surface condition.
- Regular vehicle checks to control/ensure compliance with air quality standards;
- Enforcement and penalties against traffic rules violators.
- Ambient air quality monitoring will be conducted to ensure the ambient air quality for the area will comply with the limits.

6.5.1.3 Residual Impact

Table 6-22: Air Quality and Noise Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Release of exhaust gases	Low	Improvements in road conditions are unlikely to result in a significant rise in traffic levels above the current baseline, certainly not in the numbers where significant pollution from combustion emissions could result from the additional traffic levels. Better road conditions and traffic flow will however reduce the potential for slow moving an idling cars through urban areas thereby reducing air quality impacts in these areas.	Very low
Dust	Low	Improvements to the road condition during the operational phase should ensure that dust is not a highly significant issue, but as with all	Very low



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Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
		road projects, dust cannot be entirely eliminated from roads during dry weather.	
Noise	Low	Noise levels are not anticipated to increase by more than 3dB above the ambient levels due to the relatively low levels of traffic anticipated on the upgraded roads. However, noise levels will not reduce, meaning a status quo.	Low

6.5.2 Road Safety

6.5.2.1 Impact

357. While the proposed improvements will make the road safer in some respects, the increase in traffic and the potential for higher speeds may result in more road accidents especially in populated areas where there is a potentially dangerous mix of non-motorized, two, three and four-wheel traffic using the same carriageway.

6.5.2.2 Mitigation measures

- Traffic calming measures and speed limits will be provided to reduce the impact of the traffic through populated areas.
- Crossing areas will be marked and amber flashing lights installed in areas where some population exists when full traffic signals are not warranted.
- Improved traffic signage and road markings will be used to warn motorists of impending changes in road standards and to advise appropriate speeds.
- Properly designed traffic calming measures such as speed humps, speed signs and, possibly traffic signals will be installed where settlements are nearest.
- Better enforcement of the road rules and more stringent penalties should be sought.

6.5.2.3 Residual Impact

Table 6-23: Road Safety Residual Impacts

Potential Impact	Potential Impact Significance	Residual Impact	Residual Impact Significance
Road accidents	Low	Traffic management and calming measures should reduce the potential risk of impacts, but not eliminate them altogether.	Very low

6.5.3 Economy

6.5.3.1 Impact

358. The project is expected to have significant beneficial impacts to the economy of the project area. The key benefits include:

- Improved access to health and education facilities-Improved Road conditions will most likely result in increased traffic on the roads including mini-bus and taxi services, this will enable people to access health care and educational facilities more easily.

- Creation of Jobs -The community along the alignment of sub-project will have opportunities for temporary employment during construction. Although this opportunity is temporary in nature, this will be beneficial.

6.5.3.2 Mitigation Measure

359. None required

6.5.3.3 Residual Impact

360. None. All impacts on the economy are beneficial.

6.6 Cumulative Assessment

6.6.1 Cumulative Impacts

361. Cumulative impacts are deemed to occur when the effects of project components, other projects, and/or other land use activities overlap with each other by affecting the same Valued Environmental and Social Component (VESC). That is, cumulative impacts are the incremental impact of the project when combined with the cumulative effects of other past, present and reasonably foreseeable future projects.

362. Cumulative impacts can also be due to the induced actions of projects and activities that may occur if the action under assessment is implemented, such as **growth inducing impacts** and other effects related to induced changes to the pattern of future land use or additional road network, population density or growth rate. **Induced impacts** are those that arise indirectly as a consequential effect of the project. They usually have no direct relationship with the action under assessment and represent the growth-inducing potential of an action. For example, roads leading from those constructed for a project, increased recreational activities, and construction of new service facilities are examples of induced actions.

363. For the project components under consideration in this IEE, the following considerations are pertinent:

- All upgrades to existing infrastructure and bridges works are proposed within existing landholdings, existing structures or existing rights of way. There are accordingly no cumulative impacts on physical, ecological or social resources in any of the areas subject to development or redevelopment, since all of these areas have been rural and no other main activities are in process;
- Road improvements are designed to reduce traffic congestion, increase the tourism and increase the connectivity with less potential conflict between different modes of road users, notwithstanding that such improvements may increase overall traffic flows;
- Khyber Pakhtunkhwa Cities improvement project (KPCIP) is being implemented but is in the urban cities of the KP.
- However, none of the sub-projects will lead to a permanent increase in employment; hence, the projects are not considered likely to result in any significant increase in net inward migration to the city.
- The roads and bridges will facilitate the incoming traffic. Resulting in reduction of the traffic congestion and lesser vehicular emissions.

364. The following cumulative and induced impacts may occur as a result of project implementation:

- Improvements to the roads and bridges will increase the opportunities for commercial activities therein. In the context of tourism and assess roads, however, the increase in commercial activities is deemed to be significant; and enhanced traffic flows as a consequence of roads improvements may result in increases in vehicle emissions to air, potentially resulting in deterioration to urban air quality along main transport routes. This impact is, however, assessed to be insignificant given that it is offset by reductions in vehicle emissions consequent upon a reduction in traffic congestion. Moreover, the carrying capacity of the areas is substantial and can handle this increase very well.
 - Traffic incident may increase with the increase and speedy traffic flows.
365. The overall impacts, however, are considered as positive due to the implementation of projects.

7 ENVIRONMENTAL MANAGEMENT PLAN

7.1 General

366. The possible negative effects might be mainly caused by the implementation of construction works, with little damage and carrying temporal character. To prevent or mitigate negative impacts there have been developed mitigation measures, which are involved in the EMP. The EMP will include proposed mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.
367. The EMP will be included in bidding and contract documents with specific provisions requiring contractors to:
- i. Comply with all other conditions required by Asian Development Bank and EPA
 - ii. to submit a site-specific environmental management plan (SSEMP), including proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes;
 - iii. specific mitigation measures following the approved EMP;
 - iv. monitoring program as per EMP; and
 - v. budget for EMP implementation.

7.2 Objectives of EMP

368. The main objectives of EMP are to:
- Provide details of the subproject impacts along with the proposed mitigation measures and the corresponding implementation activities;
 - Define the roles and responsibilities of the Project Proponent, Contractor, Supervisory Consultants, and other players and effectively communicate environmental issues among them;
 - Define a monitoring mechanism, and reporting frequency and identify monitoring parameters to ensure that all the mitigation measures are completely and effectively implemented, and identify the resources required to implement the EMP and outline the corresponding financing arrangements.
 - Ensure that the subproject will adopt COVID-19 best international standard operating procedures (SOPs) during the construction and operational phases.

7.3 Implementation

369. The institutional arrangement for the implementation of EMP for Communication and works (C&W) Department of KP is presented in figure 7-1. The proponent PIU-KPRRD P will be responsible for compliance with environmental and social safeguard requirements of the proposed project.
370. The proposed subproject activities will be monitored and managed by the PIU- KPRRD P. The Environmental and Social Cell (ESC) staffed by qualified environmental and social specialists has already been established under KPRRD P. The ESC will be the custodian of the EMP. ESC will support ensuring the compliance of EMP.

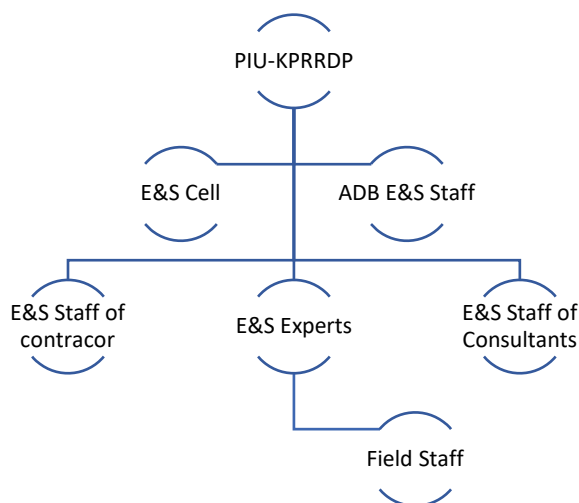


Figure 7-1: Organizational Setup for Implementation of EMP

7.4 Roles and Responsibilities of Functionaries Involved in EMP Implementation

7.4.1 Asian Development Bank (ADB)

371. The proposed project falls under category Category B in view of limited environmental and social impacts and thus requires an IEE. The ADB shall review and approve the IEE documents including EMP. The Bank shall also review and approve the biannually prepared progress reports.

7.4.2 Khyber Pakhtunkhwa Environmental Protection Agency

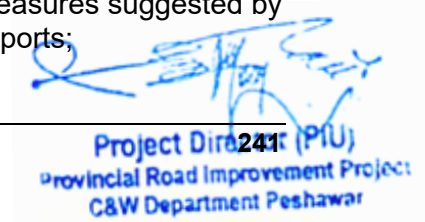
372. As per Khyber Pakhtunkhwa Environmental Protection (Amendment) Act, 2014, Khyber Pakhtunkhwa EPA is responsible for environmental protection and pollution control. The KPEPA is responsible for the approval of the IEE of all the developmental projects under their jurisdictions. As per Khyber Pakhtunkhwa Environmental Protection (Review of Initial IEE/EIA) Regulations 2021, the rehabilitation and improvement of roads will be exempted for obtaining the environmental approval. However, as discussed in section 2 the present IEE will be submitted in KP EPA to obtain the environmental approval.

373. For the subproject KPEPA monitoring reports of EMP implementation will be submitted to KPEPA for their review and further guidance.

7.4.3 PIU-KP RRRDP

374. The Project Director of PIU-KPRRD is in-charge for the financial and technical matters related to C&W. His responsibilities for monitoring the EMP will consist of:

- Ensuring that the required environmental training is provided to the concerned PIU staff;
- To carry out random site visits to the construction sites to review the environmental performance of the Contractor;
- Review monitoring reports for the progress of environment-related activities;
- Make sure that the Contractor is implementing the additional measures suggested by the Supervision Consultant (SC) in environmental monitoring reports;



- To assist the Contractor in obtaining necessary approvals from the concerned departments;
- Maintaining interface with the other line departments/ stakeholders; and
- Reporting to the Khyber Pakhtunkhwa EPA on the status of EMP implementation.

7.4.4 Environmental and Social Cell (ESC)

375. ESC has already been established in the PIU-KPRRD which is responsible to:

- Developing and finalizing the EMP will be ESC responsibility before submitting to the Bank.
- Make sure that all the contractual obligations related to environmental and social compliance are met;
- Monitor the progress regarding the implementation of environmental and social safeguards as provided in the EMP;
- Oversee the compliance of all the monitoring programs as given in EMP;
- Check randomly whether monitoring of the environmental aspects of the proposed project during construction and operational phases is being properly carried out;
- Document and disclose monitoring results and identify necessary corrective and preventive actions in the periodic monitoring reports, and make follow-up on these actions to ensure progress toward the desired outcomes;
- Make sure that the contractor implements the additional measures suggested by the SC and PIU; and
- Report the status of EMP compliance to the Project Director, PIU-KPRRD.

7.4.5 Supervisory Consultant (SC)

376. The roles and responsibilities of SC will be:

- To oversee the performance of the Contractor to make sure that the Contractor is complying with EMP;
- Ensuring that the day-to-day construction activities are carried out in an environmentally and socially sound and sustainable manner;
- Strong coordination with the Contractor and PIU-KPRRD;
- Preparing training materials and implementing programs;
- Ensure the implementation of the mitigation measures suggested in EMP;
- To supervise and monitor environmental activities being performed at the site;
- Periodic reporting as mentioned in EMP; and
- Suggest any additional mitigation measures (if required).

7.4.6 Construction Contractor (CC)

377. All the contractors will be bound to appoint site-based Environmental and Social managers with relevant educational backgrounds and experience for C&W. The contractors' Environmental and Social manager will carry out the following activities:

- Implementation of the mitigation measures at the construction site;
- Contractor will be bound through the contract to take actions against all the special and general provisions of the contract document;

- Contractor will make sure the compliance of EMP recommendations related to construction and will also be responsible for effective liaison with local heads of the community;
- Provision of proper Personal Protective Equipment (PPE) to the workers and train them for their proper use;
- Compliance with international best SOPs for COVID-19;
- To conduct the environmental and health & safety trainings to the workers/labor; and
- Coordinate with the Environmental Specialist and Social Development Specialist (SDS) of SC and PIU.
- Each CC will also be responsible for engaging a qualified Ecologist on a part time basis with knowledge of turtles and fish. The Ecologist will be responsible for ensuring that initial surveys are undertaken of all bridge sites and necessary management plans are prepared prior to the start of works. The ecologist will also provide periodic training to workers relating to the identification and management of turtles in line with the management plans.

7.4.7 Design Consultant (DC)

378. The DC will be responsible for:

- Preparation of environmental responsive design;
- Incorporation of technical design features in consideration of baseline environmental features;
- Designing of components based on futuristic and prospective needs of the subproject area.

7.5 Site Specific EMP (SSEMP) and other plans

379. The SSEMP is the document that the CC will prepare outlining how he intends to implement the EMPs and ensure that all the mitigation and monitoring is completed according to the implementation arrangements specified in the EMPs and the IEE.

380. The SSEMP will describe the precise location of the required mitigation / monitoring, the persons responsible for the mitigation / monitoring, the schedule and reporting methodology. The SSEMP will be submitted to the SC and PIU for approval at least 30 days before taking possession of any work site. No access to the site will be allowed until the SSEMPs are approved by the SC and PIU.

381. The SSEMP will include the following topic specific plans:

Table 7-1: SSMP Topic Specific Plans

Plan	Phase of the project	Responsibility	Approvals	
			PIU	SC
Pollution Prevention Plan	Before start of construction	Contractor	Yes	Yes
Health and Safety Plan			Yes	Yes
Waste Management Plan			Yes	Yes
Traffic Management Plan			Yes	Yes
Labour Management Plan			Yes	Yes
Turtle / Fish Management Plans for Bridges			Yes	Yes
Emergency Preparedness and response plan			Yes	Yes

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Plan	Phase of the project	Responsibility	Approvals	
			PIU	SC
Gender Action Plan	Before start of construction	Contractor	Yes	Yes
Trees plantation plan	Before operation	PIU/SC	-	

382. Note: To plant the trees with a ratio of 1:10 (as per KP forest department), a tree plantation plan shall be prepared in consultation with the KP Forest department and the concurrence will also be obtained from the ADB before the start of the operations of the project roads.

7.6 Institutional Arrangement for Implementation of EMP by PIU-KPRRD during O&M Phase

383. The Project Director, C&W with his ESC will be responsible for the following:
- Compliance with EMP requirements for the O&M phase;
 - Coordinating with the operational staff working under the ESC to monitor environmental compliance during project operation;
 - Advising on, and monitoring tree plantations along the buffer zone of the subproject area;
 - Reporting on the progress of environmental compliance to the Khyber Pakhtunkhwa EPA;
 - Assessing the long-term environmental impacts of subproject operation;
 - Sustaining a working partnership among the PIU-KPRRD, Khyber Pakhtunkhwa Local Government Department, Khyber Pakhtunkhwa EPA, Agriculture, Irrigation, Forest and Wildlife departments of Khyber Pakhtunkhwa, NGOs, and other related public-private sector organizations.

7.7 Reporting

384. The contractor will prepare and submit monthly monitoring reports for compliance of implementation to the supervision consultant (SC) environmental team.

Table 7-2: Reporting Mechanism

Report	Prepared by	Reviewed by	Distribution
Monthly	Contractor	Reviewed by PIU-Environmental Unit; C&W	The Engineer and PIU and ADB
Quarterly	Supervision Consultant	Reviewed by PIU-Environmental Unit; C&W	The PIU or ADB
Annual	Supervision Consultant	Reviewed by PIU-Environmental Unit; C&W	ADB
Final	Supervision Consultant	Reviewed by PIU-Environmental Unit; C&W	ADB

7.8 Non-Compliance with the EMP

385. The implementation of the proposed EMP involves inputs from various functionaries as discussed earlier. The contractor will be primarily responsible for ensuring the implementation of the mitigation measures proposed in the EMP, which will be part of the

contract documents. The provision of the environmental mitigation cost will be made in the total cost of the project. However, if the contractor fails to comply with the implementation of EMP and submission of the monthly compliance reports, deductions will be made from the payments to the Contractor claimed under the heads of environmental components.

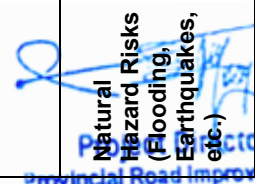
7.9 Inclusion of EMP in Bidding/ Contract Documents

386. The present EMP will be included in the bidding/ contract documents and their implementation will be contractual binding for the contractors.

7.10 Environmental Monitoring Plan

387. Monitoring will be carried out to ensure that the mitigation plans are regularly and effectively implemented. It will be performed at three levels. At the PIU level, the ESC will do EMP monitoring to ensure that the mitigation plans are being effectively implemented. The environmental engineer of the Supervision Consultant will regularly monitor the EMP implementation by the contractor. At the contractor's level, the environmental monitoring checklist will be filled on a daily basis by their environmental manager and countersigned by the environmental engineer (EE) of the Supervision Consultant.

7.11 Environment Management and Monitoring Plan (EMMtP)

Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
<p>Design Phase</p> <p>Climate Related Risks and Impacts</p>	<p>All roads and bridges especially RRD_UCH_NR1, N-CHT-6,N-CHT-7,KPR_DIK_NR11,KPR_DIK_NR13, RRD_DIK_R1, RRD_DIK_R2, RRD_DIK_R4, RRD_DIK_R6, RRD_DIK_R7, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_R1, RRD_DRU_R3, RRD_KRK_R1, RRD_KRK_R3.</p>	<p>The following mitigations are recommended to be adopted:</p> <ul style="list-style-type: none"> Climate resilience has been ensured through selection of sub-base material suitable for all weather conditions. The sub-grade and the base will be sufficiently stable as per international standards. Provision of appropriate culverts, box-culvert, side drain, water drains, protection walls, etc. have been given in the roads and bridges design especially for RRD_UCH_NR1, N-CHT-6,N-CHT-7,KPR_DIK_NR11,KPR_DIK_NR13, RRD_DIK_R1, RRD_DIK_R2, RRD_DIK_R4, RRD_DIK_R6, RRD_DIK_R7, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_R1, RRD_DRU_R3, RRD_KRK_R1, RRD_KRK_R3. For roads and bridges under extreme risk (such as RRD_DIK_R1, RRD_DIK_R4, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_NR3, RRD_DRU_NR4, KPR_KRK_NR5, RRD_KRK_R1, RRD_KRK_R3) will be designed in accordance with extreme climate scenario i.e. SSP3-7.0 or above. Considering heavy rainfall, existing culverts and drains have been resized in the design in accordance with the recommendation of climate change vulnerability assessment report of KPRRDP especially of RRD_DIK_R1, RRD_DIK_R4, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_NR3, RRD_DRU_NR4, RRD_DRU_NR5, RRD_KRK_R1, RRD_KRK_R3 roads. Proactive maintenance regime will be applied for roads and bridges maintenance during the operations phase. To reduce the CO₂ emissions of the project the low carbon products such as slag, fly ash etc, will be used where available as a blend with mix cement products as proposed in climate change vulnerability assessment report of KPRRDP. 	<p>During Design Stage</p>	<p>Design Consultant and PIU</p>	<p>PIU/ADB</p>
<p>Natural Hazard Risks (Flooding, Earthquakes, etc.)</p> 	<p>Roads are located in the seismic Zone 2B and 3 (Chitral, Swat, Dir roads and bridges especially for roads such BTG-16., BTG-2., N-BUN-2: RRD_UCH_NR1, N-CHT-1.; KPR_DIK_NR13, RRD_DIK_R1, RRD_DIK_R2, N-CHT-2.</p>	<ul style="list-style-type: none"> Required provisions in the project design, such as storm water drainage, side drain have been incorporated into the roads' design to cater to extreme weather events, including those anticipated as a result of climate change vulnerability assessment of the RRDP. 	<p>During Design Stage</p>	<p>Design Consultant and PIU</p>	<p>PIU/ADB</p>


Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
	SNG-28; SNG-20; T-22, T-12 (for details refer to serial 4.2.3. in baseline section)	<ul style="list-style-type: none"> It will be ensured that all Project components are designed and constructed in accordance with national design standards for earthquakes such as Building Codes of Pakistan, 202112. It will be ensured that detailed designs include slope protection measures to prevent/manage landslides accounting for future climate change aspects. 			
Loss of Land and Livelihood	All roads and bridges	<ul style="list-style-type: none"> Since all the project activities are within RoW therefore, mitigations for loss of land are not required. The social impacts assessment also indicates that no potential impacts are at site. However, any potential unforeseen loss of livelihood during the construction will be compensated as per the provisions of the resettlement policy framework (RPF) of the project 	During Design Stage	Design Consultant and PIU	PIU/ADB
Cutting of Trees	All roads and camp site, batching and asphalt plant sites	<ul style="list-style-type: none"> It will be ensured that contractor strictly adheres to the design and no deviation with the design occurs during the implementation of subproject. No tree cutting will be allowed outside the RoW for any project related activity, including setting up of the construction camps. In case the contractor will uproot any tree for establishment of asphalt and batching plant sites, compensatory trees with a ratio of 1:10 will be planted by the contractor with own cost. To plant the trees with a ratio of 1:10 (as per KP forest department), a tree plantation plan shall be prepared in consultation with the KP Forest department and the concurrence will also be obtained from the ADB before the start of the operations of the project roads. 	During Design and implementation Stage	Design Consultant and PIU	PIU/ADB
Impacts to Nationally and Internationally Designated Sites	Roads and bridges especially KOH-BR-24, RRD-LKH-R1, RRD-LKH-R2	<p>For all roads close to nationally protected areas sites the following conditions will be applied:</p> <ul style="list-style-type: none"> No works will be allowed within the boundary of the nationally protected areas. No access / haul routes will be allowed through the nationally protected areas. No construction camps, batching plants, asphalt plants, borrow pit, quarry, etc, shall be permitted within the nationally protected areas (including plant / pits with existing permits and licenses). <p>For all roads close to internationally designated sites the following conditions will be applied:</p> <ul style="list-style-type: none"> No works will be allowed above 1,350masl in Palas Valley. No access / haul routes will be allowed above 1,350masl in Palas Valley. No construction camps, batching plants, asphalt plants, borrow pit, quarry, etc, shall be permitted above 1,000 masl in Palas Valley or 	During Design and implementation Stage	Design Consultant and PIU	PIU/ADB


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<https://codes.icosafe.org/content/PKBC2021P1/preface>

Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<p>1,500masl in Kaya Valley. (including plant / pits with existing permits and licenses).</p> <p>During the operational phase the regional government will be responsible for promoting responsible tourism and placing signs adjacent to the respective roads and nationally and internationally designated sites informing people of the status of the site and not to encroach into the area without relevant permissions.</p>			
Construction Phase					
<p>Air Quality ((Release of exhaust gases, Dust, VOCs)</p>	<p>All roads and bridges</p>	<p>The following mitigation measures will be adopted:</p> <ul style="list-style-type: none"> Stockpiled soil and sand will be slightly wetted before loading, particularly in windy conditions. Transport through densely populated areas will be avoided. Concrete plants to be controlled in line with statutory requirements and will be not be close to sensitive receptors. Most of the excavated material will be used within the project, with minimal cut and fill material to come from outside the site. A minimum distance of 300 meters will be ensured between batching plant(s) and the nearest community, educational facility, cultural heritage site and health facility. The need for large stockpiles will be minimized by careful planning of material supply from controlled sources. Stockpiles will not be located within 50m of sensitive receptors and shall be covered with tarpaulin when not in use and at the end of the working day. If large stockpiles (>25m3) of crushed materials are necessary. Periodically check and conduct maintenance of the construction machinery and haul vehicles. Generators, compressors and vehicles used during construction works will be maintained in a good condition to ensure that emissions are kept to a minimum level. Regularly change the engine oil and use new engines/machinery/equipment having good efficiency and fuel burning characteristics. Controlled technology generators and batching plants will be used to avoid excessive emissions. Burning of wastes at any site will not be allowed. The stack height of generators and asphalt plants will be at least 3 meters above the ground. Training of the technicians and operators of the construction machinery and drivers of the vehicles. All types of vehicles, machinery and generators will comply with the NEQS (see section 2) of the IEE report. 	<p>During Design and implementation Stage</p>	<p>Contractor</p>	<p>Consultant and PIU</p>



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Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
<p>Hydrology and Effluents</p> 	<p>Bridges and roads especially for following roads: N-CHT-5, N-CHT-4, RRD-UCH-R1, N-CHT-3, N-CHT-6, N-CHT-7, N-CHT-8, KPR-DIK-NR13, RRD-KRK, R1, RRD-DRL-NR1, RRD-DRU-NR3, RRD-DIK-R1).</p>	<ul style="list-style-type: none"> To control the dust emissions regular water sprinkling (3 time during the cold season and 5 times during hot season) will be carried out by the contractor. Monthly emission monitoring of vehicles, generators and batching plants will be done. Project activities will be planned in a manner so as to avoid harsh weather conditions. Hazardous materials stored and used on site with potential gas emissions (e.g., Volatile Organic Compounds) will be in well-ventilated, but secure low-risk areas, away from major transport routes and away from the site boundary (where possible). Volatile fuels and chemicals (including hazardous wastes) will be stored in sealed containers. On site storage of large quantities of volatile fuels will be avoided, equally prolonged exposure to direct sun and heat will be avoided. Fires and material burning will not be allowed on the Project site. Chemical storage areas will be purpose built and well maintained. A data log of all chemicals with MSDSs will be provided at the storage facility within easy access. Labor and construction camps will be located at an optimal distance (500m from any sensitive receptor) from the natural water bodies (Swat river, Kurrum, Kunhar, Chitral rivers, nullah and other streams along bridges and especially for roads such as N-CHT-5, N-CHT-4, RRD-UCH-R1, N-CHT-3, N-CHT-6, N-CHT-7, N-CHT-8, KPR-DIK-NR13, RRD-KRK, R1, RRD-DRL-NR1, RRD-DRU-NR3, RRD-DIK-R1). No construction / non-construction activity will be allowed on the banks of the natural streams and rivers. In the patches where the road and the stream are running parallel, construction will be carried out in close supervision of the Engineer. Construction Camps – The Contractor will be responsible for the preparation of a Construction Camp Site Plan which will form part of the SSEMP. The Plan will indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, septic tanks, etc. The Contractor will ensure the following conditions are met within the Plan: Wastewater arising on the site will be collected, removed from the site via a suitable and properly designed temporary drainage system (fitted with oil and grease interceptor tanks) and disposed of at a location and in a way that will cause neither pollution nor nuisance. A tree fold septic tanks will be established at the camp site, the overflow from the septic tanks will be used for horticultural purposes. 	<p>During Design and implementation Stage</p>	<p>Contractor</p>	<p>Consultant and PIU</p>

Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<ul style="list-style-type: none"> • There will be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies will be prohibited. • Liquid material storage containment areas will not drain directly to surface water. • Lubricating and fuel oil spills will be cleaned up immediately and spill clean-up materials will be maintained (including spill kits) across the Contractor's construction camp and ancillary facilities, e.g., asphalt plant. • Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters. • Discharge of sediment-laden construction water directly into surface watercourses or wetlands will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge. • Spill clean-up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: • Fueling operations will occur only within containment areas. • All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tanks. • Filling and refueling will be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids. • All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. • The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any drain or watercourses. • Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited. • Should any accidental spills occur immediate cleanup will be undertaken, and all cleanup materials stored in a secure area for disposal. Disposal of such will be undertaken by a waste management company contracted by the Contractor. The waste management company must have the required licenses to transport and dispose of hazardous waste before any such waste is removed from the site. The Contractor will keep copies of the company's licenses and provide waste transfer manifests at his camp site for routine inspection by the Engineer. 			


Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
 Project Director (PIU) Provincial Road Improvement Project C&W Department Peshawar		<ul style="list-style-type: none"> • Site plans will be devised to ensure that, insofar as possible, all temporary construction facilities are located at least 300 meters away from any surface water course. • Where applicable, obtain all necessary permits from the relevant authorities for the abstraction of water for construction purposes. • The Engineer will undertake regular monitoring of the Contractors construction camp and storage areas to ensure compliance with the SSEMP and the Contractors Construction Camp Site Plan. If determined warranted by the Engineer, the Contractor will provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the Contractors camp sites. If so requested, the Contractor will ensure that all vehicles are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor will provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site. • Water supply – Two sources of potable water exist for the Contractors staff; bottled water or groundwater. If groundwater is to be used for drinking it will be tested to ensure that the water quality meets the national drinking water standards. Approximately 200 m3 of technical water will be needed per day during the construction phase and around 15 m3 of potable water per day. The Contractor shall obtain all necessary abstraction permits for both technical and potable water supplies. • Bridge Construction & Slope Protection works around rivers – the Contractor will: <ul style="list-style-type: none"> • Divert the water flow near the bridge piers. • Provide coffer dams, silt fences, sediment barriers or other devices to prevent migration of silt during construction within streams. • Perform dewatering and cleaning of cofferdams to prevent siltation by pumping from cofferdams to a settling basin or a containment unit. • Carry out construction works without interrupting the traffic on the Project Road with the provision of suitable diversions. • Ensure no waste materials are dumped in the river, including re-enforced concrete debris. • Place generators more than 20 meters from the river or nullah. • Ensure that no concrete sludge waste is dumped in the river or nullah. • Carefully collect all polystyrene (from expansion joints) so that it does not litter the local environment. • Ensure that no hazardous liquids are placed within 10 meters of the river or nullah. • Provide portable toilets at bridge construction sites to prevent defecation by workers into the river or nullah. 			

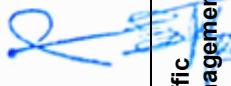
Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<ul style="list-style-type: none"> • Ensure that workers are provided with correct PPE including harnesses. • During piling works ensure that pumped water is filtered through a silt trap before being discharged to the river or nullah. • Drainage and Flooding – During the construction phase the Contractor will be required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage to properties and land by flooding and silt washed down from the works. The Contractor will arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations. Should any operation being performed by the Contractor interrupt existing irrigation facilities (especially on roads such as RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_R1, RRD_DRU_NR3, RRD_DRU_NR4, KPR_KRK_NR5, RRD_KRK_R1, RRD_KRK_R3), the Contractor will restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption. The Contractor will also be responsible for ensuring that no construction materials or construction waste block existing drainage channels within the Project corridor. The Engineer will be responsible for routine monitoring of drainage channels to ensure they remain free of waste and debris. • An emergency preparedness and response plan shall be prepared by the contractor after the award of the contract, supervision consultant will review and approved this plan. This plan will be prepared along with the site-specific environment and safety management plan to be submitted by the contractor. • Location of the construction camps will be at areas which are acceptable from environmental, cultural or social point of view. • Location of construction camps will be away from communities in order to avoid social conflict with the surrounding communities. • Contractor will provide detailed layout plan in the SSEMP which will be approved from supervision consultant and lenders for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps. The Contractor's staff quarters and labour camps will be provided with all necessary services for drainage, lighting, roads, paths, parking places, 			


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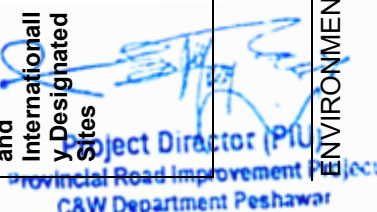
Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
<p>Soils and Geology</p> 	<p>Roads such as BTG-16, N-BUN-2, N-CHT-2, DRL-35, N-MLK-1, N-MLK-2, SNG-26, SNG-28 SNG-30, T-42, T-22 and RRD_DIK_R1, RRD_DIK_R4, RRD_DIK_NR4, RRD_DIK_NR5, RRD_DIK_NR6, RRD_DIK_NR7, RRD_DIK_NR8, RRD_DIK_NR9, RRD_DRU_NR3, RRD_KRK_NR4, KPR_KRK_NR5, RRD_KRK_R1, RRD_KRK_R3) and bridges</p>	<p>fencing, sanitation, cook-houses, fire prevention and firefighting equipment.</p> <ul style="list-style-type: none"> All labour camps, workshops and storage areas will be built on hard compacted ground with sufficient bunding and spill kits so as to prevent the loss or infiltration of leaked or spilt fluids into surrounding soils, ground water or water courses. Traffic signage shall be maintained in the camps. The Contractor will establish a drainage network, including end discharge, to drain storm water away from camps and settlements. <p>The Contractor, with oversight from the Engineer, will ensure that:</p> <ul style="list-style-type: none"> All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tank (or one tank if more than one tank is in the bund). The construction camp maintenance yard will be constructed on impervious hard standing with adequate drainage to collect spills, there will be no vehicle maintenance activities on open ground. Filling and refueling will be strictly controlled and subject to formal procedures. Drip pans will be placed under all filling and fueling areas. Waste oils will be stored and disposed of in compliance with Lao PDR regulatory requirements, international best practices or by a licensed contractor. All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any soils. No bitumen drums or containers, full or used, will be stored on open ground. They will only be stored on impervious hard standing. Regarding borrow pits. In the first instance, borrow pits that are located within two kilometers of important birds areas (especially for roads such as BN-5, N-CHT-1, N-CHT-4, RRD-LKH-R1, RRD-LKH-R2, RRD-LKH-R4, KOH-BR-24, MAN-BR-75, SNG-BR-80) or within 500 meters of sensitive receptors or urban areas will not be utilized. A due-diligence review will be conducted for all existing borrow pits/quarries proposed for use. A due diligence review will be carried out by the Engineer to confirm that these sites identified for use by the Contractor are indeed operating or operable in an appropriate manner. This will include review of the borrow pits operational license and a site visit to the borrow pits to ensure that sensitive receptors or urban areas are not located within 500 meters of 	<p>During Design and implementation Stage</p>	<p>Contractor</p>	<p>Consultant and PIU</p>


Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<p>the borrow pits. A copy of the agreement between the operator and the Contractor will also be provided to the Engineer for review.</p> <ul style="list-style-type: none"> • If the Contractor intends to open and operate his own borrow pits, the Contractor will prepare a Borrow Pit Action Plan (BAP) that will be submitted to the Engineer prior to the start of construction. The plan will identify the locations of all proposed borrow pits considering the recommendations of this report and will not be located within two kilometers of a protected area. • The locations of the borrow pits will be approved by both the Engineer. The plan will ensure that: • Pit restoration will follow the completion of works in full compliance all applicable standards and specifications. • Arrangements for opening and using material borrow pits will contain enforceable provisions. • The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts. • Additional borrow pits will not be opened without the restoration of those areas no longer in use. • The BAP will also contain the permits and licenses required for the operation of the borrow pits. • While operational, the Contractor will ensure that the following conditions are met at his borrow pits: • Loss of topsoil - Before the materials extraction the layer of top soil (about 20 cm) will be removed to the side of excavation area and kept until the area works will be finalized. Topsoil stockpiles will be located at least 50 meters distance from any watercourses to avoid water siltation and obstruction. The height of stockpiles will not exceed three meters to avoid wind erosion and dust emissions. • Fencing – if the Engineer deems the site to be hazardous to the local community (for example a pit could fill with water and people and animals could drown in it) he will request the Contractor to fence the site to prevent access and provide warning signs on the fencing. • Soil compaction and disturbance to local flora and fauna species at access roads - The Contractor will take responsibility to provide an access road to the borrow site and all drivers will be instructed to use only this officially designated road. This will help to avoid additional soil compaction and disturbance to the local fauna species. • Reinstatement - Full site reinstatement will be undertaken by the Contractor to avoid landscape damage and habitat loss. Rehabilitation 			



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Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by	
 Traffic Management	All roads and bridges	<p>measures will include: removing of all types of equipment from the site; removing of all types of waste or/and polluted soil and materials if any exist; slops grade reduction with use of unsuitable stockpiles and uncrushed rocks and; slope stabilization measure such as re-covering with top soil, and further seeding, grassing and planting of appropriate bushes or/and trees if reasonable.</p> <ul style="list-style-type: none"> • Haul Routes - Due to the sensitivity of the borrow pit locations, the Borrow haul routes will follow established transport corridors/rights-of-way, to the extent that is practicable. The routes will be indicated in the Contractors TMP. Haul routes will not pass within protected areas. • Erosion - During construction, the Contractor will be responsible for ensuring material that is less susceptible to erosion will be selected for placement around bridges and culverts. In addition, he will ensure re-vegetation of exposed areas including: (i) selection of fast growing and grazing resistant species of local grasses and shrubs; (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth. The Engineer and the Contractor will both be responsible for ensuring that embankments are monitored continuously during construction for signs of erosion. • Topsoil – To reduce impacts to topsoil the following measures will be employed by the Contractor; locate topsoil stockpiles outside drainage lines and protect stockpiles from erosion; construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil; rip ground surface prior to the spreading of topsoil; and remove unwanted materials from topsoil such as roots of trees, rubble and waste etc. Specifically, regarding soil compaction, the Contractor will confine operation of heavy equipment within the ROW, as much as possible, to avoid soil compaction and damage to privately owned land. If in case private lands are disturbed, the contractor should promptly inform the owner and agree on the ways to remedy the situation. • Slop protection: Before to start any construction activity at areas where slop cutting involved (especially BTG-16, N-BUN-2, N-CHT-2, DRL-35, N-MLK-1, N-MLK-2, SNG-26, SNG-28 SNG-30, T-42, T-22), the contractor shall submit a work plan which will be approved by the supervision consultants and PIU. The works will only be allowed after approval from PIU. A slop stabilization plan will be prepared before to start of works and approval will be obtained from CSC and PIU. <p>Mitigation measures will include:</p> <ul style="list-style-type: none"> • In cooperation with the local traffic authorities, properly organize transport of materials for the project to avoid congestion 		During Design and	Contractor	Consultant and PIU



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Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<ul style="list-style-type: none"> • Set up clear traffic signal boards and traffic advisory signs at the roads going in and out the road and bridge construction sites to minimize traffic build-up. • Regularly monitor traffic conditions along access and Project roads to ensure that project vehicles are not causing congestion. • Provide sufficient lighting at night within and in the vicinity of construction sites. • Implement suitable safety measures to minimize risk of adverse interactions between construction works and traffic flows through provision of temporary signals or flag controls, adequate lighting, fencing, signage and road diversions. • Provide temporary accesses to properties and establishments affected by disruption to their permanent accesses. • Reinstate good quality permanent accesses following completion of construction. • Provide safe vehicle and pedestrian access around construction areas. • Provide adequate signage, barriers and flag persons for traffic control. • If necessary, traffic will be diverted for safe and smooth movement of vehicles to ensure smooth traffic flow and minimize accidents, traffic hold ups and congestion. The diversion signs would be bold and clearly visible particularly at night. • Temporary bypasses will be constructed and maintained (including dust control) during the construction period particularly at bridge crossings. Location of temporary bypasses shall be agreed with local authorities and such sites shall be reinstated upon completion of works. 	Implementation Stage		
<p>Biodiversity and Impacts to Nationally and Internationally Designated Sites</p> 	All bridges and roads especially such as BN-5, N-CHT-1, N-CHT-4, RRD-LKH-R1, RRD-LKH-R2, RRD-LKH-R4, KOH-BR-24, MAN-BR-75, SNG-BR-80	<p>The following general mitigation measures will be applied</p> <ul style="list-style-type: none"> • General impacts - The works footprint will be reduced as far as possible e.g. through the use of a single vehicle track policies and use of low-impact vehicles where practical. Vehicles will be driven at designated speed limits. Off-road travel will be prohibited where practical. Laydown areas and compounds will be sited to avoid unnecessary clearance of vegetation. All staff will be provided with biodiversity awareness training. Workforce hunting and fishing bans will be enforced and cutting of wood by workers will be prohibited. Fencing will be minimized to ensure that areas vital for wildlife are not isolated by workforce activities, unless this is for species protection measures. Temporary barriers will be used to prevent wildlife from accessing waste disposal areas and similar areas. • Tree cutting – No tree cutting in Forest Reserves without explicit permission from District Forest Officers. Any tree cutting will be compensated per national guidelines. Tree re-planting by the Contractor 	During Design and Implementation Stage	Contractor	Consultant and PIU


Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<p>for any tree cut on a 1:10 basis, using species and locations determined between the District Forest Officer and the Contractor.</p> <ul style="list-style-type: none"> Tree Plantations - Tree plantations on top of embankments and in RoW will serve as small forests and wood lots for the local residents, having tangible benefits in the shape of timber, fuel wood and fodder. Besides soil retention, erosion control and biotic improvements, such plantations will also provide aesthetic and visual screens against sound, dust, wind, toxic emissions, vibrations, night glare and pollution of waterways. Riparian Habitats - Works will be minimized within riparian areas to safeguard aquatic organisms. Crossing points across rivers will be conducted where there is clear access to the banks and vegetation clearance is minimized. Standard pollution control measures will be implemented in all sites (e.g. to prevent silt contamination water will be kept out of the works area using appropriate isolation techniques, such as coffer dams, silt fences and by-pass channels). Camp and storage locations and field activities will be at least 50m from watercourses where practical. Erosion control using 'polders', pads of plants and geo-nets will be implemented. Where trees have to be removed to facilitate the crossing, these will be replanted with a similar species composition. Excavations - Pits and excavations will be filled in as soon as possible following works. Trenches and pits to be created for longer than 48h periods will have 450 ground ramps to allow escape by fauna should they fall in. A pre-start check for fauna will be completed prior to works commencing in the morning if trenches are left open overnight. Regular crossing points will be installed to ensure wildlife can cross excavations, berms and drainage channels. Non-native / Invasive Species - Native plants that are locally sourced will be used for re-planting. A site wide ban will be placed on workers bringing vegetation or soil from outside the site area to prevent dispersion of non-native invasive species. Minimize topsoil movement. No hunting, poaching or killing of animals will be permitted. No cutting down of vegetation or using vegetation or trees as firewood will be permitted. The following mitigation measures will be adopted by the Contractor to ensure that encroachment into nationally and internationally designated sites does not occur: <ul style="list-style-type: none"> Any area within 50 meters of any park will be fenced off and warning signs erected to ensure that workers are aware of the park boundary and not to enter this area. Works in these areas will be confined to the daylight periods to avoid the requirements for artificial lighting in these areas. 			

Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
 Project Director (PIU) Provincial Road Improvement Project C&W Department Peshawar		<ul style="list-style-type: none"> Weekly toolbox training to workers operating in the areas adjacent to the Park throughout the construction period. Daily inspections of the work sites in this area to ensure that there has been no encroachment into the Park and that all fencing is intact. Any construction litter of waste in the Park will be removed immediately. No construction camp, asphalt plant, rock crushing plant, concrete batching plant, or laydown area will be allowed within 500 m of the Park. Special status fish – Contractor will consult with the relevant local environmental protection department to determine the fish spawning periods of the identified special status fish. Contractor will avoid all works in the river during this period. Where practical works shall be undertaken during periods of low flow. A strict ban on fishing by workers shall be enforced. Turtles - Prior to works starting, the proposed bridge sites will be surveyed by suitably qualified ecologists to map up-to-date baseline conditions of all bridge sites. The work will focus on the presence / potential presence of notable species, as discussed earlier in this document. It will: <ul style="list-style-type: none"> Employ survey techniques that are fully auditable, repeatable and in line with good practice guidance and undertaken by a suitably qualified professional. Be conducted at a suitable time of year for the target habitats and species. Based on the findings of the surveys a turtle management plan will be prepared for each bridge where specific risks have been identified. The management plan will include requirements for daily inspections of bridge sites prior to the commencement of works to identify and remove turtles from work zones in accordance with the plan. Eating or selling of the turtles by workers will be a sackable offence. The contractor (especially for KOH-BR-24, RRD-LKH-R1, RRD-LKH-R2) and supervision consultants will ensure that the contractor facilities (such as camps, waste disposal points, batching and asphalt plant site) are 500m from any tree clusters, and forest area. No hunting, poaching and caging of the birds will be allowed for all project roads and bridges especially for KOH-BR-24, RRD-LKH-R1, RRD-LKH-R2. It shall be ensured that no nesting (new or old) are disturbed due to any project activities on all roads and especially at KOH-BR-24, RRD-LKH-R1, RRD-LKH-R2 Mitigation Measures for Pallas Area 			


Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
 Project Director (PIU) Provincial Road Improvement Project C&W Department Peshawar		<ul style="list-style-type: none"> • Hunting and poaching of species will be completely banned within important bird areas and the offenders will be heavily fined and punished for such an offence. • Enabling and construction works will be carried out in the pre-determined RoW so that all unnecessary habitat loss or degradation is avoided. • During the construction phases of the road network, the working schedule will be planned and the speed limit will be placed on the service roads. • Materials brought for road construction will be placed in unused places or away from the water sources as much as possible. • Materials released during road construction will be quickly removed from the area by selecting suitable areas outside the site. • As a part of road construction and maintenance repair activities, cleared areas will be restored to their natural state. • Along with existing road networks, areas where natural vegetation is bare or badly degraded, as well as areas used to obtain road construction materials, will be re-planted with species suitable for the region. • Fencing practices must be ensured to minimize the risk of deterioration of the area during road network construction. • Construction vehicles, equipment and machinery will remain confined within their designated areas of movement. • Suitable and well-maintained equipment will be used. • Noise pollution reduction will be planned to protect wild animals and their acoustic environment before road construction. • Materials leaving the construction site shall be transported during non-peak hours in order to minimize traffic noise due to the increase in traffic volumes • Native, locally sourced plants or seeds will be used for habitat restoration and there will be a ban on workers bringing vegetation or soil from outside the site area to prevent dispersion of non-native invasive species. Wash down of all vehicles and equipment will be mandatory and the Environmental Specialist (contractor) will be responsible for identifying and removing any invasive species. • Areas where vegetation has been temporarily cleared will be restored to as close to their original condition as possible, as long as this is consistent with safety and visibility for road traffic • Seeds for restoration will be gathered from the local vegetation. • The Project will also ensure all construction workers are also banned from the killing of any snakes or other reptiles. 			

Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
<p>Community Health & safety</p> 	<p>All roads and bridges</p>	<ul style="list-style-type: none"> • If snakes are discovered on sight, they will be left alone and allowed to disperse. The designed in animal crossings and culverts will also be suitable for some reptiles and help reduce some unnecessary mortality. • Animal corridors must be provided along the whole alignment and specially in vicinity of fauna species areas wherever necessary. • Inform construction and operation staff (including contractors) on the habitats of conservation value and protected critically endangered, endangered, and vulnerable plant and animal species. • Socialization programme with local villages to promote awareness of importance of habitats of birds and plant species of important value. • Clear demarcation of areas to be cleared during construction. • Prevent and reduce hunting and logging in areas opened through the creation of new or improved access roads. • Prevent and reduce mortality of wildlife from collision from vehicles. • Light control within Project Area to minimize disturbance to species. • Methodical clearance of forested areas under ecological supervision. • Using no-noise or lay noise construction machines, no construction activity from dusk to dawn. • The work on bridges with seasonal flow will start during the dry season to avoid impacts on fish (Table 4.4 shows that 24 of 32 bridges belong to this group). For the remaining 8 bridges, the contractor will consult with the relevant local environmental protection department. <p>The following mitigation measures will be implemented:</p> <ul style="list-style-type: none"> • Work areas within and outside the project sites, especially where machinery is involved, will be barricaded and will be constantly monitored to ensure that local residents, particularly children stay away while excavated areas are being prepared for road. Road related infrastructure will be cordoned off. Also, no machinery will be left unattended, particularly in running condition. • Local communities in the project area will be briefed on traffic safety. • Proper and adequate nighttime lighting will be provided at the construction sites, including warning lights for traffic. • Proper signage and reflectors will be installed at appropriate locations. • Proper signage and reflectors will be installed at appropriate locations. • Speed limit of 20 km/hr will be maintained by all project related vehicles and nighttime driving of project vehicles will be limited where possible. • The contractor will prepare a site-specific traffic management plan before the start of the work and will get it approved by the site safety in-charge of consultant and resident engineer. 	<p>During Design and implementation Stage</p>	<p>Contractor</p>	<p>Consultant and PIU</p>


Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
<p>Labour and Working Conditions</p> 	<p>All roads and bridges</p>	<ul style="list-style-type: none"> Educate drivers on safe driving practices to minimize accidents and to prevent spillover of hazardous substances and other construction materials during transport. Contractor will take proper safety measures (placing warning tapes around excavations) to avoid people, especially children, accidentally falling into excavations. All the working platforms will be cordoned off with special care by well-trained skilled workers. Contractor will prepare a construction management plan before the mobilization at site and within 15 days after the award of the contract. This plan will also include the hazard prevention and safety plan, which will address health and safety of the people in the project area. PIU will ensure the contractor staff working in the project are well trained and educated in the Health, Safety and Environment (HSE) hazards associated with their duties, and that of the public, in the project area. Awareness about roads related current and potential environmental threats for the public at large and roadside dwellers, in particular, requires due attention; the aspect neglected in the past. Enhanced education in road related environmental issues and awareness raising can be achieved through campaigns by; Visual graphics, Print media, Seminars & workshops. Wherever possible, PIU along with Social and environment expert of CSC must involve local communities, for contractors' camp locations, resource sharing with construction workers and their choice of tree species. In this way a sense of ownership will be inculcated in local residents who will also protect core roads and its related resources. The past practices of isolated working methodology must transform The Contractor will be required to implement an effective Occupational Health and Safety (OHS) Plan that is supported by trained first aid personnel and emergency response facilities. Construction contracts will include standard Occupational Health and Safety measures and contractors will be bound to implement these fully. The OHS Plan will be fully aligned with the OHS Improvement Plan for Transport Sector OHS and Hazard Specific Guidelines & Critical Controls. Monitoring will be carried out to ensure that the health and safety plan based on contract specifications is followed. Cement feed hopper areas will be inspected daily to ensure compliance with the requirement of dust masks. Surfaces (including flooring and work surfaces) in camps, kitchens, dining areas and workshops will be solid and easy to clean. 		<p>Contractor</p>	<p>Consultant and PIU</p>
			<p>During Design and implementation Stage</p>	<p>Contractor</p>	<p>Consultant and PIU</p>

Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
 Project Director (PIU) Provincial Road Improvement Project C&W Department Peshawar		<ul style="list-style-type: none"> • All drivers engaged by Contractor will hold a valid license for the vehicle they are operating. • Work in confined space (i.e. under the culverts, existing's bridges, drains also where the scaffoldings is being used) shall be executed with available safety standards. Adequate monitoring and equipment shall be available to detect deficient oxygen levels. • The Contractor shall submit to the Engineer of CSC for approval an emergency evacuation plan. • The Contractor shall submit to the Engineer of CSC for approval a site layout plan, identifying work areas, accommodation, kitchen, dining area, sanitary facilities, location of generators, plant and vehicle parking, transport routes through the camp, pedestrian routes through the camp, evacuation routes, emergency exits, batching plants, storage areas, waste facilities etc. • Fire extinguishers will be provided throughout camps and work sites. Fire extinguishers will be inspected monthly and maintained as necessary. • An adequate and reliable supply of safe drinking water shall be made available at readily accessible and suitable places including at all camps. • The Contractor shall take samples of drinking water monthly and arrange for analysis of these samples at KP EPA certified laboratory. The results of these test will be submitted to the Engineer of CSC and must demonstrate that the water meets national and World Health Organization (WHO) standards for drinking water. • The Contractor shall provide and maintain adequate hygienic kitchens which are sheltered and separated from the living quarters. Kitchens shall include raised and washable surfaces suitable for food preparation. • The Contractor shall provide and maintain adequate hygienic dining areas for staff. Workplaces and camps will be provided with both natural and artificial light. Artificial lighting will be powered by solar panels / generators in the event of power cuts. • All OHS protocols will be implemented in true letter and spirit. • Contractor will appoint an OHS resource to implement, monitor and report the HSE management plan to concerned authorities. • Contractor will ensure the provision of a reasonable number of first aid kits and first aid facilities at construction sites and camps through hiring medics and establishing a dispensary at the campsite. • Site personnel will be provided appropriate types of personal protective equipment (PPEs). Contractor will ensure consistent use of PPEs. • Based on the type of hazard applicable during the proposed works at site, the following mitigation measures as per IFC guidelines for Occupational Health and Safety (OH&S) will be implemented: 			


Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<ul style="list-style-type: none"> Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment will be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Turning off, disconnecting, isolating, and de-energizing (Locked Out and Tagged Out) machinery with exposed or guarded moving parts, or in which energy can be stored (e.g. compressed air, electrical components) during servicing or maintenance. Installing equipment, where feasible, to enable routine service, such as lubrication, without removal of the guarding devices or mechanisms. Marking all energized electrical devices and lines with warning signs; Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools; Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter (GFI) protected circuits; Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas; Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work. Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific workstation (a solid piece of light metal, canvas, or plywood designed to block welding light from others). Special hot work and fire prevention precautions and Standard Operating Procedures (SOPs) will be implemented for welding or hot cutting outside established welding work stations, including 'Hot Work Permits, stand-by fire extinguishers, stand-by fire watch, and maintaining the fire watch for up to one hour after welding or hot cutting has terminated. Fuel storage areas and generators will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area will be equal to 120% of the total volume of fuel stored. Storing flammables away from ignition sources and oxidizing materials. Flammables storage area will be: <ul style="list-style-type: none"> Remote from entry and exit points into camps Away from facility ventilation in takes or vents Have natural or passive floor and ceiling level ventilation and explosion venting Use spark-proof fixtures 			



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Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<ul style="list-style-type: none"> • Be equipped with fire extinguishing devices and self-closing doors, and constructed of materials made to with stand flame impingement for a moderate period of time. • Defining and labeling fire hazards areas to warn of special rules (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment). • Providing specific worker training in handling of flammable materials, and in fire prevention or suppression. • Workers who are required to handle chemicals will be provided with specialized training and provided with, and wear, appropriate PPE (gloves, apron, splash suits, face shield or goggles, etc). • Working schedules will be developed and maintained to avoid long exposure to harsh weather conditions. • Construction workers will be provided training on Emergency Preparedness and Response Plan to respond to any natural hazards. • Obligatory insurance against accidents for laborers/workers; • Providing basic medical training to specified work staff and basic medical service and supplies to workers; • Layout plan for campsite, indicating safety measures taken by the contractor, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing and contingency measures in case of accidents; • Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for laborers; • Provision of adequate sanitation, washing, cooking and dormitory facilities including light up to satisfaction; • Provision of appropriate PPEs to workers, e.g. helmet, adequate footwear for bituminous pavement works, protective goggles, gloves, earmuffs etc.; • Ensure strict use of wearing these protective clothing during work activities; • Elaboration of a contingency planning in case of major accidents; • Adequate signage, lightning devices, barriers, yellow tape and persons with flags during construction to manage traffic at construction sites, haulage and access roads. • Implementation of labor management procedure and plan already prepared and disclosed for the project. • For activities around bridges and water courses, the following shall apply: Development of the appropriate construction method. 			



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Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<ul style="list-style-type: none"> The provision of the life jackets and personal floatation devices (for working in water) Workers may be designated to perform the rescue tasks Workers are informed about appropriate rescue procedures Workers are trained in rescue procedures and use of rescue equipment Workers may need to be trained in cardiopulmonary resuscitation (CPR) and first aid As part of the site specific EMP, the contractor will prepare, obtain approval of, and implement an occupational health and safety (OHS) plan. OHS Plan will contain general guidance for all identified hazards under each work activities, and site-specific OHS hazard and risks during construction, and control and preventive measures. The Plan shall be reviewed and updated if there any changes in the construction methodologies. Conduct 'job hazard analysis' at the bridge rehabilitation / construction site to identify potential hazards that may arise from the proposed works or working conditions to the project workers and implement necessary control measures. The job hazard analysis will be part of the contractor's method statements, which will be reviewed and approved by the OHS Specialists of the supervision consultants. The specialists will also visit the construction sites prior to the start of construction to ensure the control measures are in place. Regular site inspections and safety audits by the construction supervision team, both by the OHS specialists and the site engineers. Site engineers will be trained by their OHS team on monitoring the safety aspects of the construction works. All workers will wear life vests when working near and over water. Regular training program for workers on occupational health safety (monthly training and daily toolbox talks). Special attention will be focused on the use of life vests, ring buoys, hazard awareness, and emergency response plan. Incident investigation and reporting, including a complete record of accidents and near misses, will be maintained. Availability of firefighting, ambulance, medical and rescue facilities at the site for implementation of an emergency response plan Contractors will have dedicated and qualified staff for ensuring compliance with the OHS Plan. Awareness-raising material will be used, including posters, signage, booklets, and others at the worksites. With regards to worker conduct and behavior, the following shall be applied: 			



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Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
 <p>GBV and SEA/SH</p>	All roads and bridges	<ul style="list-style-type: none"> Local population will be given preference in construction related jobs. Most unskilled workers will be hired from local communities, while for skilled manpower also, first choice will be given to local area residents. The Contractor will prepare the construction camp management plan which, in addition to other components, will include the labor influx management plan. This will be reviewed and approved by CSC. The Contractor will select specific timings for the construction activities particularly near the settlements, so as to cause least disturbance to the local population, particularly women. Contractor will take due care of the local community and observe sanctity of local customs and traditions by his staff. A Workers Code of Conduct will be developed and strictly implemented, which will warn the staff strictly not to involve in any unethical activities and to obey the local norms and cultural restrictions. During construction activities, if privacy of the nearby households is affected, the Contractor will inform the house owner to make some arrangements. Similarly, Contractor will take care as much as possible that the construction activities should not affect the privacy. The contract will explore alternative water sources and ensure that water usage by the project does not affect or compete with water requirements of the local community. The Contractor will also ensure that noise and light pollution from the labor camp is kept at minimal levels especially at night. The labor camp will be 500m away from any residential dwellings. Regular medical checkup of workers for communicable diseases. Fencing of labor camp. STD control and management plan will be prepared by the contractor and the same will be implemented with letter and spirit. SEA/SH related complaints received through the GRM will have dedicated staff trained on handling and responding to GBV/SEA/SH cases in survivor-centric approach. To mitigate the potential for forced/child labour the Contractors will prepare a labour management plan (LMP) will include details on mitigating the risk of child labor and forced labor. Contractors will be prohibited from hiring children below the age of 15 for any type of labor, and below the age of 18 for hazardous work. Project staff will monitor sites to check for child labor A Gender Action Plan will be developed and implemented, and systems will be set up to work with the project GRM to address any GBV, SEA/SH related complaints. 	During Design and implementation Stage	Contractor	Consultant and PIU

Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
Child Labour and Protection	All roads and bridges	<ul style="list-style-type: none"> The GRM will be equipped with dedicated staff trained to handle and respond to GBV/SEA/SH complaints in a survivor-centered manner Orientation on GBV/SEA/SH to the project staff and workers Awareness on GBV/SEA/SH to community members Mapping of GBV service providers No child labour (under 18 years) will be allowed at all sites of roads and bridges rehabilitation works. The labour record will be available where in special focus will be given on the age of the worker. All worker will be allowed only once the CSC will check the appointment record of permanent and daily wages workers. In case any case reported for child labor the CSC will immediately report to the PIU and the child will be protected as per all human rights rules prevailing in the province. Child labour will be reported immediately to the concerned labour department and child will be transferred to the child rehabilitation 	During Design and implementation Stage	Contractor	Consultant and PIU
Noise and Vibration	All roads and bridges	<ul style="list-style-type: none"> The following mitigation measures will be implemented: Equipment noise will be reduced at source by proper design, maintenance and repair of construction machinery and equipment. Noise from vehicles and power generators will be minimized by use of proper silencers and mufflers. Excessive noise emitting equipment will not be allowed to operate and will be replaced. Blowing of horns will be prohibited on access roads to worksites. In case blasting is required, only controlled blasting will be employed, with adequate prior intimation to nearby communities. As a rule, the operation of heavy equipment shall be conducted in daylight hours. Well-maintained haulage trucks will be used with speed controls. Use of ear plug and ear muffs will be ensured during construction. No employee will be exposed to a noise level greater than 85 dB (A) for a duration of more than 8hours per day without hearing protection. In addition, no unprotected ear will be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C). Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls will be investigated and implemented, where feasible. 	During Design and implementation Stage	Contractor	Consultant and PIU


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Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
	<p>All roads and bridges</p>	<ul style="list-style-type: none"> • Periodic medical hearing checks will be performed on workers exposed to high noise levels. • All the equipment and machinery used during the construction phase will be proactively maintained in compliance with NEQS. • Grievance redress mechanism will be established for workers and community. • Exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, will be controlled through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure. • No equipment and machinery with loose or vibratory parts will be allowed to work. Use of rollers for land grading will be carried out during day times and with intermittent intervals to reduce the impacts of vibration on the surrounding environment. • Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and workdays will be limited to less noise-sensitive times. Hours-of-work will be approved by the Engineer having due regard for possible noise disturbance to the residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential areas, medical facilities, educational facilities, and religious temples the Contractor's hours of working will be limited to 8 AM to 6 PM. During religious holidays the Contractor will not work within 250 meters of any temple. • Community Awareness, i.e., public notification of construction operations will incorporate noise considerations • The contractors will be required to prepare a waste management plan for the site in light of guidelines provided in the EMP and submit to PIU for approval. This plan will cater to sorting of hazardous and non-hazardous materials prior to disposal, placing of waste bins at the project sites for waste disposal and an onsite hazardous waste storage facility i.e. designated area with secondary containment. • No asphalt plant working on the old principles involving Asbestos will be employed for the subproject. • Construction waste and debris, after sorting and removing any hazardous content, could be used for the leveling of surfaces and other construction activities outside of the subproject. Such waste will be offered to other contractors working on other Government construction works or nearby communities. If any party is interested in acquiring this 			
			<p>During Design and implementation Stage</p>	<p>Contractor</p>	<p>Consultant and PIU</p>

Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<p>material and reusing it; the same will be offered at no cost, provided they transport it themselves.</p> <ul style="list-style-type: none"> Licensed waste contractors will be engaged to dispose of all non-hazardous waste material that cannot be recycled or reused. All types of combustible and non-combustible waste including plastic or glass bottles and cans will be temporarily stored at designated places. Waste management training for all site staff to be included in Contractor's waste management plan Fuel storage areas and generators will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area should be equal to 120% of the total volume of fuel stored. Fuel and hazardous material storage points will be included in the camp layout plan to be submitted for approval. Hazardous material storage areas shall include a concrete floor to prevent soil contamination in case of leaks or spills. Fuel tanks will be checked daily for leaks and all such leaks will be plugged immediately. Designated vehicles and refueling points will be included in the camp layout plan to be submitted for approval. Hazardous waste will be initially stored on site at designated areas and then handed over to EPA certified contractors for final disposal. Record of waste generation and transfer shall be maintained by project contractors. Spill kits, including sand buckets (or other absorbent material) and shovels must be provided at each designated location. At the time of restoration, septic tanks will be dismantled and backfilled with at least 1m of soil cover keeping in view the landscape of the surrounding natural surface. It will be ensured that after restoration activities, the campsite is clean and that no refuse has been left behind. Clinical wastes will be temporarily stored onsite separately and will be handed over to approved waste contractors for final disposal. Training will be provided to personnel for identification, segregation and management of waste. 			
<p>Physical Cultural Heritage</p> 		<ul style="list-style-type: none"> The Contractor will prepare a chance find procedure. The procedure will incorporate all of the requirements of the GoKP regarding chance finds. In the case of a chance find, the contractor will secure the site and report immediately to Supervision Consultant and PIU The following 'chance-find' principles will be implemented by the contractor throughout the construction works to account for any 	<p>During Design and implementation Stage</p>	<p>Contractor</p>	<p>Consultant and PIU</p>

Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
		<p>undiscovered items identified during construction works at all roads and bridges sites:</p> <ul style="list-style-type: none"> (i) in case some heritage found during the construction, the workers will be trained in the location of heritage zones within the construction areas and in the identification of potential items of heritage significance. (ii) Should any potential items be located, the site supervisor will be immediately contacted and work will be temporarily stopped in that area. (iii) If the site supervisor determines that the item is of potential significance, an officer from the department of Archaeology (DoA) will be invited to inspect the site and work will be stopped until DoA has responded to this invitation. (iv) Work will not re-commence in this location until agreement has been reached between DoA and proponent as to any required mitigation measures, which may include excavation and recovery of the item. (v) A precautionary approach will be adopted in the application of these procedures. 			
Access	All roads and bridges	<ul style="list-style-type: none"> • Mitigation measures will include public awareness through media, proper traffic diversion plans, appropriate sign boards and timely completion of the project. • For specific receptors, especially sensitive receptors, alternate temporary access will be provided for foot-traffic. Also, people taking their animals to grazing grounds in this area might face accessibility issues. • Mitigation measures will include public awareness through media, proper traffic diversion plans, appropriate sign boards and timely completion of the subproject. • The rehabilitation work will be carried out in batches; next batch will only start once the previous batch is done. This will ensure that not the entire road becomes impassable at any given time. This activity will be adopted for all roads. 	During Design and implementation Stage	Contractor	Consultant and PIU
Operational phase					
 <p>Air Quality</p>	All roads and bridges	<ul style="list-style-type: none"> • Tree plantation in the area will be carried out by the PIU. As per KP Forest general tree plantation rule, 100 trees per kilometer will be planted as part of tree plantation initiative. PIU will coordinate with the Forest Department for cost estimates and location of tree plantation. As part of trees plantation campaign around 14000 trees will be planted with the consultation of the forest department. • Comprehensive Operational and Maintenance Rules as per ISO standards should be prepared and implemented by the C&W. 	During the operation	C&W	C&W

Issue	Location	Mitigation Measure	Timings	Implemented by	Supervised / Approved by
Road Safety	All roads and bridges	<ul style="list-style-type: none"> • Strict application of traffic rules and regulations, including those about the fitness of vehicles • Regular maintenance of engineering works of road. • Regular road maintenance to ensure good surface condition. • Regular vehicle checks to control/ensure compliance with air quality standards; • Enforcement and penalties against traffic rules violators. • Ambient air quality monitoring will be conducted to ensure the ambient air quality for the area will comply with the limits. • Traffic calming measures and speed limits will be provided to reduce the impact of the traffic through populated areas. • Crossing areas will be marked and amber flashing lights installed in areas where some population exists when full traffic signals are not warranted. • Improved traffic signage and road markings will be used to warn motorists of impending changes in road standards and to advise appropriate speeds. • Properly designed traffic calming measures such as speed humps, speed signs and, possibly traffic signals will be installed where settlements are nearest. • Better enforcement of the road rules and more stringent penalties should be sought. 	During the operation	C&W	C&W
Economy	All roads and bridges	<ul style="list-style-type: none"> • Overall positive trends are anticipated 	During the operation	C&W	C&W

Legend:

ES – Environment Specialist;

CSC – Construction Supervision Consultants Gender

PIU- Project Implementation Unit



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7.12 Environmental Monitoring Requirement

388. The Environmental Mitigation and Monitoring Plan provides the framework for the implementation of the mitigating measures and monitoring during the preconstruction, construction and operation phases of the proposed project (Table 7.2) whereas Table 7.3 gives estimate for monitoring of the environmental quality parameters during construction phases of the proposed project.

7.13 Pre-Construction Ambient Environment Monitoring

389. Environmental Monitoring locations have been identified for Ambient Air, Noise and Water Quality monitoring. The criteria for selection of monitoring locations will be the nearest sensitive receptors.

Table 7-3: Environmental Monitoring Plan


Environmental Control	Location	Means of Monitoring	Frequency	Responsibility Implementation	
				Responsibility Implementation	Monitoring
Preconstruction–Before Site Preparation					
Initial Community Meetings	Along the road & Ancillary sites areas	Method: Consultation & observations Parameters: Consult village leaders, communities, affected people and observe the requirement for signboards Required for contract details, contacts of PIU and GRM details	Before site preparation and as required	Contractor	CSC/PIU
Preconstruction–Baseline Monitoring (Project Specific)					
Air Quality	Key Sensitive receptors along the corridor	Method: establish baseline conditions by measuring criteria pollutants Duration: 24hours continuous monitoring	Once before site Preparation	Contractor will hire an independent certified lab/ KP EPA approved	CSC/PIU
Water Quality and Quantity	500 meters upstream and 500 meters downstream of major water Body crossings	Method: establish baseline conditions Parameters: Temperature, pH, TDS, BOD, COD, Phenols, Chloride, Copper, Lead, Manganese, Sulphate, Zinc, Silver, Boron, Barium, Iron	Once before site Preparation	-do-	CSC/PIU
Noise	Key Noise Sensitive Receptor	Method: Establish project specific baseline conditions at key Noise receptors inside and outside for equivalent noise levels dB (A). Duration: 24hours continuous monitoring	Once before site Preparation	-do-	PIU/CSC
Construction Stage–Impact Offset					
Community Discussion	Communities	Minutes of meetings	Every three months	Contractor	PIU/CSC
Interview with affected people	Where required along the entire strip	Non-Compliance Notices (if any) to the Contractor by CSC after consultation	When required or quarterly	CSC	PIU
Site Preparation & Vegetation Clearance	Construction Corridor (All along the road)	Visual inspection of loss of vegetation, soil erosion & instability, surface water pollution	Daily or Weekly when required	Contractor	PIU/CSC

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Environmental Control	Location	Means of Monitoring	Frequency	Responsibility Implementation	
				Contractor	Monitoring
Operation of Borrow and Quarry site	Barrow pits Quarry Area	Visual inspections of: Quarry sites/ borrow areas for change in landscape and creation of water ponds. Fertile layer conservation of soil, Photographs (area specified for borrow pits) Complaints and interview with near by communities about Inspection of possession of: official approval or valid operating license of primary suppliers (asphalt, cement, quarry and borrow material), Haulage distance Recycling /reuse	Once before operation for photographs and then on monthly basis	Contractor	PIU/CSC
Material Supply	Material Supply Sites		Before the agreement for supply of material is finalized.	Contractor	PIU/CSC
Storage and Handling of materials	Material storage yard/ Work area and Construction camps	Visual Inspection of Covered storage facilities Iron bar/ cast Iron placement stands	Weekly/ Monthly	Contractor	PIU/CSC
Traffic Safety	Entire road, Haul roads	Visual inspection of: Signage, Safety barriers Flagmen, Temporary by-passes Complaints log Accident records, Interview	Weekly and as needed	Contractor	PIU/CSC
Air Pollution Control	Active site near sensitive sites and settlements, Storage Yards Asphalt and Batching Plants	Air Quality Monitoring: Mobile Lab Duration: 24 hours continuous monitoring Visual inspection of: Fugitive dust, Open burning, Sprinkling/ dust suppression techniques, Truck covering, Covered Stock piles. Visual inspection to ensure asphalt plant equipped with dust controlling devices and located >500 m from residential areas. Dark smoke Speed limits Stock piles covered	Quarterly	Contractor	PIU/CSC
Noise Control	Near the sensitive sites and settlements Construction sites	Noise meters Duration: 24 hours continuous monitoring Visual inspection of conditions of equipment, Enclosures, Generators and Compressors operate with door closed.	Quarterly Weekly	Contractor Contractor	PIU/CSC PIU/CSC
Waste water Pollution Control	Active site & Campsite	Visual inspection of: Septic tanks and untreated discharge of wastewater to stormwater (color, litter, foam), Silt removal facilities, Covering of manholes Stagnant water at Batching plants & Asphalt plant Septic Tank testing (BOD, COD, N, P, Oil & Grease) Kitchen water, Washing bays	Weekly	Contractor	PIU/CSC
Surface Water Quality	500 meters upstream and 500 meters down stream of major Water body crossings	Water quality monitoring Parameters: TSS, Temperature, BOD, COD, oil & grease, Turbidity, Lead, Zn, Iron, Nitrate, Phosphate	Quarterly during bridge construction	Contractor	PIU/CSC

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Environmental Control	Location	Means of Monitoring	Frequency	Responsibility Implementation	
				Monitoring	Monitoring
Drainage & Sedimentations	Entire road, culverts & drains	Visual inspection	Monthly After precipitation	Contractor	PIU/CSC
Fire Prevention	Active site and camp sites	Visual inspection of Fire extinguishers Marked assembly area Displaying of emergency contact detail	Weekly and as required	Contractor	PIU/CSC
Climate Change Resilience	Entire Project	Inspection of: Energy conservation controlling devices Wastage of raw material Leakages of oil, water, fuel Efficient use of machinery Material resistant to extreme weather Least material transport distance Drainage/high Risk flooding areas, ponds, wetlands Green Infrastructure: eye lands, Trees, landscape	Monthly	Contractor	PIU/CSC
Resource Conservation	Active site and camp site workshop, filling station	Visual inspection of Equipment not in use shut off Oil, fuel, water leakages Gas cylinders to avoid timber Wastage of raw materials Recycling/ Reuse	Monthly	Contractor	PIU/CSC
Storage of Chemicals and Dangerous Goods	Filling area Workshops Store rooms	Visual inspection of: Storage with License conditions Labeling, Sealed containers, Suitable trucks for haulage Chemical spillage Spill kit/sand/ saw dust Secondary containment Locks. MSDS Training records	Weekly or as required	Contractor	PIU/CSC
Waste Management	Active Construction site and campsites, toilet, kitchen, runoff	Visual Inspection of: Clean, tidy, litter free Housekeeping Separate bins/ containers Removal of construction waste Litter, foam in nearby drains Collection Contractor Licensee Oil rags/used tires/contaminated soil Scum over stored water Disposal site Interviews	Daily	Contractor	PIU/CSC
Workers Health & Safety	Work sites Batching & Asphalt Plants Campsite (water quality)	Visual Inspection of: Detours and dust suppression lavatories & shower's water availability Onsite traffic control First aid kit, eye wash station, Medical Practitioner & ambulance Ambience and illumination PPEs issued/ used Barricading, Drinking water Testing, Eating area Training Records, Workplace safety instruction and	Weekly Drinking water quality testing once before start and annually at camp sites	Contractor	PIU/CSC
Community safety	Entire Project Area Barrow pits Quarry Areas Asphalt & Batching Plants	Complaints register Traffic related accidents, record Traffic Diversions Deterioration of existing roads, Water pounding	Monthly	Contractor	PIU/CSC


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Environmental Control	Location	Means of Monitoring	Frequency	Responsibility Implementation	
				Implementation	Monitoring
Protection of Fauna & Flora	In the project area	Access restriction to camps, Uncovered openings/open trenches Abandoned structures/ Partially demolished Complaints related to vector born disease Interviews with workers & locals Visual inspection of: Sheep and grazing animals in campsite, Use of timber, Crops along corridor Animal Corridors, Plantation work	Daily	Contractor	PIU/CSC
Cultural and archeological sites	At work sites or graveyards (if shifting required) Entire project Area	Visual inspection and record	Daily, weekly as required	Contractor	PIU/CSC
Socio-economic Issues	Entire project Area	Visual inspection of existing roads deterioration, Utilities related complaints, Record of conflict incidents,	Monthly	Contractor	PIU/CSC
Training	Entire Project	Training records, Interviews with workers Topics: OHS and Emergency Response, Community Information	6-Monthly/ based onsite requirements	Contractor	PIU/CSC
Reinstatement of work-related sites, demobilization, Works Contract Sign off & Handover		Visual inspection of: Clear sites, Construction waste disposal Site, Safety, Drainage, Landscaping Comparing ancillary site area with photographs taken before start of work	Once before sign off	Contractor	PIU/CSC



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Table 7-4: Break Up Of Environmental Management And Monitoring Cost

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	18 million	64,594.84	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	09 million	32,297.42	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 4.2 million	15,072.13	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 4.0 million	14,354.41	
	Water = 4.5 million	16,148.71	
	Waste Water = 4.1 million	14,713.27	
Personal Protective Equipment (PPEs)	Safety Shoes = 4.0 million	14,354.41	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 2.0 million	7177.20	
	Ear Plugs =2.0 million	7177.20	
	Safety Jacket =2.0 million	7177.20	
COVID and STD Prevention Measures	4.8 million	17225.29	For all project staff during the implementation of project
Tree Plantation (Before start of operation)	35.5 million	127,395.39	Tree Plantation for the project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc)	2.4million	8612.65	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	4.0 million	14,354.41	Lumpsum cost
Labour management cost (safe drinking water, first aid medical facilities, sanitation facilities.)	4.0 million	14,354.41	Lumpsum cost
Total	104.50	375008.94	


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The package wise cost breakup is given as below:

Table 7-5: Break Up of Environmental Management and Monitoring Cost-Package 1

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
	Safety Shoes = 0.307 million	1,104.185	
Personal Protective Equipment (PPEs)	Helmet = 0.153 million	552.092	For all project staff during the implementation of project
	Ear Plugs =0.153 million	552.092	
	Safety Jacket =0.153 million	552.092	
	COVID and STD Prevention Measures	0.369 million	
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-6: Break Up of Environmental Management and Monitoring Cost-Package 2

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-7: Break Up of Environmental Management and Monitoring Cost-Package 3

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-8: Break Up of Environmental Management and Monitoring Cost-Package 4

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-9: Break Up of Environmental Management and Monitoring Cost-Package 5

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-10: Break Up of Environmental Management and Monitoring Cost-Package 6

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-11: Break Up of Environmental Management and Monitoring Cost-Package 7

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-12: Break Up of Environmental Management and Monitoring Cost-Package 8

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-13: Break Up of Environmental Management and Monitoring Cost-Package 9

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-14: Break Up of Environmental Management and Monitoring Cost-Package 10

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-15: Break Up of Environmental Management and Monitoring Cost-Package 11

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-16: Break Up of Environmental Management and Monitoring Cost-Package 12

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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Table 7-17: Break Up of Environmental Management and Monitoring Cost-Package 13

Items	Allocated Cost (Pak. Rupees)	Allocated Cost (USD \$)	Remarks
Contractor Environmental Specialist	1.384 million	4968.833	One environmental Specialist with intermittent inputs for each package
Contractor HSE Staff	0.692 million	2,484.416	Lumpsum cost
Environmental Monitoring (for air, noise, water and waste Water analysis)	Air = 0.323 million	1,159.39	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Noise = 0.307 million	1,104.185	
	Water = 0.346 million	1,242.208	
	Wastewater = 0.315 million	1,131.79	
Personal Protective Equipment (PPEs)	Safety Shoes = 0.307 million	1,104.185	Environmental monitoring and provision of PPEs for workers during the implementation of project
	Helmet = 0.153 million	552.092	
	Ear Plugs = 0.153 million	552.092	
	Safety Jacket = 0.153 million	552.092	
COVID and STD Prevention Measures	0.369 million	1,325.022	For all project staff during the implementation of project
Safety signs (safety sign, reflector taps, safety cones, safety flags etc.)	0.184million	662.511	Lumpsum cost
Trainings (GBV, protected area, HSE, SSEMP preparation and implementation)	0.307 million	1,104.185	Lumpsum cost
Labor management cost (safe drinking water, first aid medical facilities, sanitation facilities,)	0.307 million	1,104.185	Lumpsum cost


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8 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

8.1 General

390. This section describes the outcomes of the stakeholder consultation process as part of the IEE. The feedback from communities and other stakeholders directly or indirectly affected by the project is collected so that it may be used to adjust and improve the project's design, planning, implementation and help the implementation structure ensuring that the project is both environmentally and socially sound. The consultation process was carried out in accordance with the requirements of the provincial environment protection agency as well as the donor agency requirements on public consultation.
391. All consultations were carried out in accordance with the 'meaningful consultation' guidelines of ADB's SPS 2009 and their outcome is discussed in the proceeding sections.
392. Meaningful consultation is a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.
393. The objectives of consultation process were;
- To gather information on relevant issues so that the feedback received could be used to address these issues at an early stage,
 - To disseminate information on the project and its expected impact, long-term as well as short-term, among primary and secondary stakeholders,
 - To determine the extent of the negative impacts of different project activities and suggest appropriate mitigation measures.
 - Obtaining local and indigenous knowledge about the environment and people living in the project area;
 - Interaction with the project affected population and other stakeholders for the collection of primary and secondary data on environment and people; and
 - Engaging stakeholders for maximization of the project benefits.

8.2 Identification of Stakeholders

394. Stakeholders are considered to be individuals or organizations which have an interest in the proposed project or knowledge that would provide insight into issues or affect decision making related to the proposed project. On the basis of interest and role criteria there are two types of stakeholders for the proposed project as described below:

8.2.1 Primary Stakeholders

395. The primary stakeholders are the initial stakeholders, such as affected persons, general public residing in the project and subproject areas. Accordingly, the consultations/ focus group discussions were made with all primary stakeholders for sharing of information

about the proposed project and expected impacts and understanding about the concerns by category of stakeholders.

8.2.2 Secondary Stakeholders

396. The secondary stakeholders are the representatives of Government Departments / Agencies involved in the planning, design, implementation and operation of the project, including various government departments such as project implementation unit at divisional levels, District Administration, WAPDA, Wildlife, KP Agriculture and Livestock Department, Irrigation Department, Fisheries Department Forestry & Environment, and Agriculture including the Horticulture wing, provincial highway, PIU, non-governmental organizations (NGOs), the broader interested communities including academia and journalists, and general public and other relevant departments.

8.3 Stakeholder Consultation Process

397. As part of the present environmental and social assessment, detailed consultations were carried out through village meetings and focus group discussions (FGDs) with the communities in the project and subproject areas.

398. Separate meetings were held with the institutional stakeholders in the form of one-to-one meetings i.e. with EPA, head office and directorates offices, KP Wildlife Department, KP Forest Department, District Administration, WAPDA, Wildlife, KP Agriculture and Livestock Department, Irrigation Department, Fisheries Department Forestry & Environment, and Agriculture including the Horticulture wing, provincial highway, local and national NGOs, PIU etc. Details of this consultation process are described below;

399. The overall strategy for stakeholder’s consultation is as shown in **Table - 8.1**.

Table 8-1: Process of Stakeholder Consultation

Stakeholders	Purpose of consultations	Methodology	Stage
Primary Stakeholder	<ul style="list-style-type: none"> Information gathering and data collection. Information sharing about the project (disclosure) Opinion seeking (concerns and expectations) Grievance redress Involvement of PAPs 	<ul style="list-style-type: none"> Focus Group Discussions Formal and informal meetings Community meetings 	<ul style="list-style-type: none"> Base line Study Impact Assessment Inventory of Losses (if any) Price fixation Discloser (if required)
Secondary Stakeholder	<ul style="list-style-type: none"> Participation in the process Information gathering Authentication and validation of the processes verification of the record 	<ul style="list-style-type: none"> One on one meetings In-depth interviews Group meetings 	<ul style="list-style-type: none"> On need basis

400. Stakeholder consultation for this project was planned process in various time and months of year 2023 and 2024. The meetings were conducted to inform stakeholders about the project and how it may affect their lives / activities, and to record their concerns, whether real or perceived.

401. Details of consultation components are described in the **Table - 8.2**.



Table 8-2: Project Components & PAPs in the Project Area

Project Component	Key Stakeholders	Interest	Influence
Rehabilitation of Existing Roads	People residing or having land, petty businessmen around the approach road in the project’s AOI i.e., near the Construction Camps and Staging Areas, within Right of way of roads, etc.	H	M
	Community Leaders in the main settlements, Transporters, local contractors	H	H
	Local Government Departments i.e., Tehsil Municipal Administration Offices, Telecom and WAPDA (for utilities), Water & Sanitation Agency, Wildlife and Forest Department, EPA, Wildlife and Forest department	H	M
Rehabilitation of Existing bridges	Communities especially children (male/female) residing in the project area, disable person in the project area, education department, local government etc. KP Irrigation department	H	M
Definitions: H = High (The peak level of interest and as per the law the highest power of influence, M = Moderate (Greater than normal/usual level of power and interest, L = Low (No/Less than the normal/usual level of interest and power)			

8.3.1 Primary Stakeholders Consultation

402. Apart from gathering of quantitative data through household survey of the area of influence of the project and survey of project affected people (indirect affectee) and other local community to share the information about the project and record their concerns/ feedback associated with this project. In this context, APs shared their view point regarding the assessment especially price assessment, compensation (if any) and procedure for entering their concerns/ grievances. It is pertinent to mention that all projects’ activities on all rural roads are with the available RoW and no direct APs are anticipated due to proposed project.

8.3.2 Topics For Discussed During Primary Consultation

403. The points related with project components, its activities and impacts were discussed during the public consultations. Apart from these points following observations were made during the consultation:

- Needs, priorities and reactions of the population regarding the proposed project.
- Role of the roads in promotion of the tourism in consulted areas.
- Roles of roads in communities connection and local business improvement
- Employment and livelihoods of communities.
- Gender and women issues (especially the practices of the females as working ladies)
- Contractor’s camp site access and Environmental issues
- Role of the affectees (if any) in implementation of the project
- Land acquisition and resettlement issues, if any,



404. Discussion with the women of the project area was carried out by the female enumerators. Women of the area were found optimistic regarding the project and subproject activities. Due to parda restriction and keeping in views the social norms of the area the name pictorial views are limited available.

8.3.3 Information Disclosure

405. The two-fold disclosure process was adopted for project implementation information for the local community and all institutional stakeholders i.e. (1) during the preparation of the IEE the community and surrounding population were consulted and their views / concerns were recorded, mitigation measures recommended in the IEE. (2) after administrative approval of the project the IEE report will be disclosed on the donor agency and C&W websites for public information. The consultations were conducted and recorded by Ms. Nabia Suhail (Sociologist), Mehmood Amjad (Sociologist), Adnan Sharef (Sociologist) and Muhammad Mujahid (Environmentalist) and enumerators. During these consultations, the primary and secondary stakeholders were briefed on the project components in detail and all their concerns and feedback were recorded. All consultations were carried out in accordance with the 'meaningful consultation' a guideline of international donors (ADB's SPS 2009) and their outcome is discussed in the proceeding sections.
406. As part of the present IEE, detailed consultations with over 280 different stakeholders were conducted through village meetings and focus group discussions (FGDs) with the communities in the project area. Separate meetings were held with the institutional stakeholders in the form of one-to-one meetings i.e. with EPA, District Coordination Office, Additional District Coordination (Finance), Tehsil Administration, Wild Life Department, Forest Department, Environmental Practitioner and Local NGO etc.

8.4 Consultations Process and Methods used

407. Meetings with stakeholders consisted of community consultation meetings, focus group discussions, and in-depth interviews with community.

8.4.1 Secondary Stakeholders Consultation

408. The secondary stakeholders consulted were the representatives of Government Departments / Agencies involved in the planning, design, implementation and operation of the project, including various government departments.

Table 8-3: Institutional Stakeholders

Consultation Location	Date	Number of Participants	Comments	IEE Follow-up
Khyber Environment Agency-Head Peshawar Pakhtunkhwa Protection Office	18-04-2023	3	<ul style="list-style-type: none"> Meeting with the Director General EPA (Mr. Anwar Khan) held and details of project was discussed. He appreciated the project and emphasis was given that the project should comply all the prevailing EPA laws, during implementation. Every proponent of the project (C&W in instant case) is required to obtain the environmental approval under KPEPA before the commencement of the project, he informed. 	<ul style="list-style-type: none"> Compliance will be made once the project will obtain the administrative approval.
Environment Agency (Divisional Directorate-Swat, Abbottabad and D.I. Khan)	11/13-04-2023	7	<ul style="list-style-type: none"> Meetings with the Directors EPA, Swat, Abbottabad and D.I. Khan were held and details of subproject were discussed with all directorates. They appreciated the project and subproject and demanded that the EMP should be part of the contractor construction contract. The Director South (D.I. Khan Mr. Zakir) further informed that for permanent batching and asphalt plants approval from the divisional directorate shall be required. 	<ul style="list-style-type: none"> The proponents (KP C&W) will ensure that EMP is part of the contract document and all regulatory approvals are obtained before the commencement of the project.
KP Forest Department, Peshawar	12-13 April 2023	6	<ul style="list-style-type: none"> The District Forest officers Shangla, Mansehra and Laki Marwat were consulted as part of institutional stakeholder. They appreciated the project and confirmed that no potential threatened or endangered species are found in the candidate roads especially in Shangla, Swat, Mansehra and D.I Khan subproject areas. 	<ul style="list-style-type: none"> The EMP/SSEMP implementation shall be carried out during the entire period of the project.
Livestock Department, Peshawar	19-04-2023	3	<ul style="list-style-type: none"> The meeting with livestock department included the briefing of project and subproject and discussion of waste disposal. No concern was shown by the officials. 	<ul style="list-style-type: none"> The EMP implementation will be carried out during the entire period of the project.
Irrigation Department, Peshawar	19-04-2023	2	<ul style="list-style-type: none"> Meeting with Irrigation Department was held and the project details were shared with them. Moreover, the data of nullah and river that runs through project areas was discussed. They shared discharges of nullahs in the project area and their runtime. No concern was shown by the 	<ul style="list-style-type: none"> During the implementation of the project, it shall be ensured that no water channels are disturbed due to project implementation.

Consultation Location	Date	Number of Participants	Comments	IEE Follow-up
Assistant Commissioner Office (Shangla)	13-06-2023	3	<p>official. They also informed that Naig and Male Khwar (bridges sites) has no potential flooding nullahs.</p> <ul style="list-style-type: none"> The project work was briefed to Assistant Commissioner, Shangla. Then he held a meeting with Patwaris and appointed them for boundary demarcation of subproject area. No major concern was shown by the officials. 	<ul style="list-style-type: none"> The consultation will be continued during the project implementation.
Assistant Commissioner Office, (Mingora)	16-06-2023	3	<ul style="list-style-type: none"> The subproject work was briefed to Assistant Commissioner, Mingora. Meeting with Patwaris were held in the office of the AC-Mingora regarding confirmation of the right of way. No major concern was shown by the officials. 	<ul style="list-style-type: none"> The consultation will be continued during the project implementation.
KP C&W Department	19-06-2023	4	<ul style="list-style-type: none"> All the Chief of the C&W appreciated the project and desired to expedite the design and final documentations. 	<ul style="list-style-type: none"> As per the instructions all the instruments are final.


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Table 8-4: Institutional Stakeholders

Sr. No.	Department Name	Date	Participants			Consultation and Responses
			Total	M	F	
1.	Environment Protection Agency, (Divisional Directorate, Peshawar)	28-09-2023	3	3	0	<ul style="list-style-type: none"> Meeting with the Director EPA Peshawar held and details of subproject was discussed. He appreciated the subproject and demanded the subproject should comply all the EPA laws, during the project implementation. This included the national environmental quality standards for noise, air quality and noise during the implementation of the project.
2.	KP Forest /Wildlife Department	28-09-2023	2	2	0	<ul style="list-style-type: none"> The District Forest officer, Mohamad and Charsadda was consulted as part of institutional stakeholder. He appreciated the project and confirmed that no potential threatened or endangered species are available in the subproject COI.
3.	Irrigation Department (Chitral)	2-10-2023	3	3	0	<ul style="list-style-type: none"> Meeting with Irrigation Department was held and the subproject details were shared with them. Moreover, the data of nullah that runs through project areas was taken from them. They provided discharges of nullahs in the subproject area and their runtime. No concern was shown by the official.
4	KP C&W Department	2-10-2023	3	3	0	<ul style="list-style-type: none"> All the Chief of the C&W appreciated the subproject and desired to expedite the design and final documentations.

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Table 8-5: Community Consultation

Sr. No.	Location of consultation	Date	Number of Participants			Comments	IEE Follow-up
			Total	M	F		
1	Khyber Agency Landikotal	25-09-2023	12	12	0	People were not aware about the project. However, after the briefing given to them, they appreciated the project and subproject activities.	It is suggested that consultation process during the subproject implementation may be continued and communities of subproject may be involved through disclosure of subproject activities and regular meetings with locals.
2	Khyber Agency Gamber Khel	25-09-2023	21	3	19	People of Gamber khel appreciated the subproject and hoped that jobs will be provided to the locals.	The implementation of the subproject will create the jobs (around 3000 for labors) opportunities for which locals should be provided preferences especially the non-technical jobs and if available for technical jobs as well for local communities.
3	Khyber Agency Sarkai kamber	26-09-2023	14	2	12	People appreciated the subproject and hoped that jobs will be provided to the locals	Locals will be preferred for jobs during the subproject implementation.
4	Mohmand Agency Machni	26-09-2023	16	16	0	In Machni people of the subproject area demanded the jobs on preference basis.	Locals will be preferred for jobs during the subproject implementation.
5	Mohmand Agency - Saparay and Banglow kaly	27-09-2023	18	18	0	During the consultation the locals showed concern that during the implementation the road blockage may cause disturbance to business.	It is suggested that EMP may be implemented with letter and spirit during the implementation of the subproject.
6	Mohmand Agency - Kado Kor	27-09-2023	13	13	0	The community of appreciated the subproject activities and hope that it will cause increase business opportunities early transportation of their products to market (especially Marble products).	The implementation of the subproject will create the job opportunities for which locals should be provided preferences especially non-technical jobs and if available for technical jobs as well.
7	Mohmand Agency - Jhangirabad and Kuladhand	28-09-2023	17	17	0	The communities demanded that during subproject implementation there should not be any hindrance in the movement of residents or their animals, the approach toward their farms / agri-land should	Residents will be notified prior to the commencement of construction activities and alternate routes will be provided. Farming and other activities will not

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Sr. No.	Location of consultation	Date	Number of Participants			Comments	IEE Follow-up
			Total	M	F		
8	Khora Kalii and Peshawar (Chota puli)	28-09-2023	24	18	06	remain uninterrupted. There should not be any damage / loss of public infrastructure / utilities, property, structure, livelihood etc.	be hindered The loss will be prevented or minimized by taking corrective measures as proposed in the EMP of the subproject. Contractor will be bound to restore the site back to its original conditions before handing over.
9	Akhood Dheri Utmanzai	2-10-2023	23	23	0	The dust emission should be controlled to avoid the air borne diseases.	Strick implementation of EMP and regular water sprinkling is recommended during the subproject implementation.
10	Jabbar (Dir)	11-4-23	11	11	0	The people appreciated the subproject. They informed during the consultation that many people of other provinces visit the area due to its natural environment. The community of the Jabbar and Nishan Banda urged to start the work at the earliest, they believe that the subproject will bring the prosperity and business opportunities through tourism in the subproject areas. They also demanded the jobs for locals.	The design and implementation of the subproject will be started soon after the approval of codal formalities. Locals will be preferred for jobs in the subproject area.
11	Nishan Banda	11-4-23	09	09	0	Construction activities must not hinder the movement of residents or their domestic animals for farming	The business and other activities will not be hindered. Residents will be notified prior to the commencement of construction activities and alternate routes will be provided for the schools and other sensitive receptors.
12	Nishan Banda	11-4-23	10	10	0	There should not be any damage / loss of public infrastructure / utilities, property, structure, livelihood etc.	The loss will be prevented or minimized by taking corrective measures as proposed in the ESMP of the subproject. Contractor will be bound to restore the site back to its original conditions before handing over.

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Sr. No.	Location of consultation	Date	Number of Participants			Comments	IEE Follow-up
			Total	M	F		
13	Daskor Bala	12-4-23	08	08	0	Any sort of damage to crops or trees is not acceptable to the community.	The piped network will be placed along the Right of Way (RoW) and agricultural fields will not be disturbed. Only some vegetation or wild bushes may need to be cut during construction works. Contractor shall be instructed not to disturb the existing trees. In case of any loss compensation will be provided.
14	Badalai	12-4-23	14	14	0	Priority for employment should be given to residing communities;	Opportunities for employment will be generated for the locals and contractors shall be instructed to preferably hire local labor if sufficient skilled labor is available in the project area.
15	Ashrum/Kalam	11-6-23	13	13	0	They informed during the consultation that many people of other provinces visit the area due to its natural environment. The community of the Kalam and Ashram urged to start the work at the earliest, they believe that the subproject will bring the prosperity and business opportunities through tourism in the subproject areas. They also demanded the jobs for locals.	Opportunities for employment will be generated for the locals and contractors shall be instructed to preferably hire local labor if sufficient skilled labor is available in the project area.
16	Matta and Maglor	12-6-23	17	17	0	They informed during the consultation that many people of other provinces visit the area due to its natural environment. The community of the Gabeen, Matta and Maglor urged to start the work at the earliest, they believe that the subproject will bring the prosperity and business opportunities through tourism in the subproject areas. They also demanded the jobs for locals.	The design and implementation of the subproject will be started soon after the approval of codal formalities. Locals will be preferred for jobs in the subproject area.
17	Garah issa khan Kulachi (D.I.Khan)	11-11-23	18	18	0	During the consultation the local community showed little interest in the road construction instead showed interest	Education and medical facilities will be provided as part of the other component of the

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Sr. No.	Location of consultation	Date	Number of Participants			Comments	IEE Follow-up
			Total	M	F		
18	<ul style="list-style-type: none"> Kulachi Guldad (D.I.Khan) 	12-11-23	23	23	0	<p>in provision of medical interest.</p> <p>The community of the NR-14 and NR10 demanded the jobs on preference basis. They believed that the road development will improve the infrastructure development in the area and resultant increase economic development.</p>	<p>subproject.</p> <p>The implementation of the subproject will create the job opportunities for which locals should be provided preferences especially on non-technical jobs and if available for technical jobs as well.</p>
19	<ul style="list-style-type: none"> Rangpur Janobi Adil Sipra Essa Khan (D.I.Khan) 	13-11-23	27	27	0	<p>The communities demanded that during subproject implementation there should not be any hindrance in the movement of residents or their animals, the approach toward their farms / agri-land should remain uninterrupted.</p>	<p>Residents will be notified prior to the commencement of construction activities and alternate routes will be provided. Farming and other activities will not be hindered</p>
20	<ul style="list-style-type: none"> Saggu Akhmad Attal Sharif. (D.I.Khan) 	14-11-23	37	37	0	<p>There should not be any damage / loss of public infrastructure / utilities, property, structure, livelihood etc.</p> <p>The dust emission should be controlled to avoid the air born diseases.</p>	<p>The loss will be prevented or minimized by taking corrective measures as proposed in the EMP of the subproject. Contractor will be bound to restore the site back to its original conditions before handing over.</p> <p>Strict implementation of EMP and regular water sprinkling is recommended during the subproject implementation.</p>



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Meetings with Institutional Stakeholders





Consultation in Malakand and Mansehra Division



Female Consultation

Consultation in Khyber

**Female Consultation in Khyber
General Public Consultation - Pictorial Views**





9 GRIEVANCE REDRESS MECHANISM

9.1 General

409. The social and environmental issues relating to the implementation of the project works and their mitigation shall be identified in the EMP/SSEMP document. However, in spite of best efforts, there is every chance that the individuals / communities affected by the project are dissatisfied with the measures adopted to address the adverse environment or social impacts of the project. In this situation an effective Grievance Redressal Mechanism (GRM) is established to ensure timely and successful implementation of the project. It will also provide a public forum to the aggrieved to raise their objections and through conflict resolution, address these issues adequately.
410. The main objective of the GRM is to investigate charges of irregularities and complaints received from any affected person and provide an early, transparent and fair resolution. Keeping in view the findings of the baseline study, it is anticipated that the nature of such complaints maybe as following:
- Problems in the location of contractor's infrastructure like camp site, etc.
 - Any disruption by the civil works by contractor/s like water channel disturbance, shops or housing structures disturbance, etc.
 - Non-observance of project principles as laid down in the contract documents
 - Any other issue arising during the project implementation including the dust generation, tree cutting, indiscriminate disposal of solid waste, involuntary resettlement, if any, traffic issues, community health and safety, etc.

9.2 Review of Existing Grievance Redress Systems

411. A number of existing grievance redress mechanisms are available within relevant government departments for citizens to lodge complaints. The KPRRD GRM may leverage these existing mechanisms, which may be supplemented as needed with subproject-specific arrangements. However, considering the environmental and social risks associate with the subproject, the dedicated subproject GRM will be the primary avenue for grievance resolution, with existing systems being leveraged as and when required. An overview of existing grievance redress mechanisms is provided in the table below.

Table 9-1: Existing Grievance Redress Mechanism

Department	Mechanism	Mode
National	Pakistan Citizen's Portal	Mobile application
Khyber Pakhtunkhwa	KP Citizen's Portal	Mobile application

412. Further details on the existing grievance redress mechanisms are provided in the SEP.

9.3 Pakistan Citizen’s Portal (PCP) - National level

413. Headed by the Prime Minister’s Performance Delivery Unit (PMDU)¹³, Pakistan Citizen’s Portal is an online integrated GRM which connects all government organizations at the federal and provincial level through a mobile application. Available on both Android and iOS, PCP is used for lodging complaints against any government department or functionary, seeking guidance/information regarding government procedures and to provide suggestions to the government for the resolution of any issue pertaining to the interest of the general public. User Guidelines Manual for PCP is available in both Urdu and English¹⁴. Despite being a robust GRM, PCP’s utility to the project’s disadvantaged and vulnerable stakeholders is limited due to low female coverage and because of it being a mobile app-based platform which cannot be accessed by persons with no access to mobile phones, with low ICT literacy, or those living in areas with no network connectivity.

9.4 KP Citizen’s Portal

414. The KP Citizen’s Portal¹⁵ is a highly interactive mobile application aimed at serving information and services, dissemination of information, citizen engagement, and redressal of public complaints. The effective use of modern ICT-based and e-governance tools helping citizen in getting latest information about essential citizen services, i.e., domicile, fard, and birth certificate, etc. Besides, the system implements a closed loop regarding complaint management works as the helping hand for the government officers supervised by the Secretaries, Commissioners and Deputy Commissioners in the Districts in effective resolution of citizen grievances. The system is implemented in 1500 offices of Khyber Pakhtunkhwa where actual complaints are received, reviewed and resolved.

9.5 Grievance Redress Committee (GRC)

415. Under the GRM, a Grievance Redress Committee (GRC) is already established in PIU and at project site, which looks into all the grievance cases related to social, resettlement and rehabilitation. The same levels of committee officials already notified will work in GRC for the upcoming project at divisional level of the proposed project, the member are included as following:

Table 9-2: Composition of Construction Site GRC at Site

S. No.	Designation	Position in GRC
1	Assistant Director Construction (Concerned)	Chairman
2	Resident Engineer (Concerned)	Member
3	Assistant Resident Engineer (Concerned)	Member cum Secretary
4	Project Manager (Contractor)	Member
5	Resettlement Expert (Consultant)	Member
6	Environmental Expert (Consultant)	Member
7	Environmental Expert (Contractor)	Member
8	Elected Representative of Local Govt.	Member

¹³ <https://web.citizenportal.gov.pk/sign-in>

¹⁴ <https://citizenportal.gov.pk/index.php#about>

¹⁵ <https://pmru.kp.gov.pk/kp-citizen-portal.php>



S. No.	Designation	Position in GRC
9	Focal Person (Admin. Department)	Member
10	Affected Persons	03 Member
Total =		12 Members

416. The Committee will locally resolve the grievance/complaints within seven days. If it fails to address the complaint within seven days, it will refer the complaint to the project /PIU level committee along with a brief report.

9.5.1 Project /PIU Level GRC

417. The following PIU Level GRC has already been notified by the PIU to promptly address the grievances, the same hierarchy will be implemented for this project, **Table - 9.2;**

Table 9-3: Composition of Project/PIU GRC for Proposed Project

S. No.	Designation	Position in GRC
1	Project Director	Chairman
2	Deputy Director (Co-ord & CM)	Member cum Secretary
3	Deputy Director (Concerned)	Member
4	Assistant Director (Concerned)	Member
5	Resident Engineer (Concerned)	Member
6	Elected Representative of Local Govt.	Member
7	Focal Person (Admin. Department)	Member
8	Resettlement Expert (Consultant)	Member
9	Environment Expert (Consultant)	Member
Total =		09 Members

418. The GRM will be gender responsive, culturally appropriate and readily accessible to the stakeholders at no cost and without retribution.

419. The step-wise process of the proposed GRM is summarized below.

420. **Stage 1:** When a grievance arises, the aggrieved person may contact directly with the contractor/PIU/CSC to resolve the issue of concern. If the issue is successfully resolved, no further follow-up is required.

421. **Stage 2:** If no solution can be found at Stage 1, the affected person(s) may submit an oral or written complaint to the GRC at site level. ARE will log the complaint along with relevant details in the community complaint register. The affected person(s) can also approach GRC without going through the Stage 1 described above. For each complaint, the GRC must investigate the complaint, assess its appropriateness/eligibility and identify an

appropriate solution. It will provide a clear response within seven working days to the complainant, PIU and Contractor (where relevant). The GRC will, as appropriate, instruct the responsible entity to take corrective actions. The GRC will review the responsible entity's response and undertake additional monitoring as needed. During the complaint investigation, the GRC will work in close consultation with the Contractors, CSC, PIU and other relevant agencies. The responsible entity should implement the redress solution and convey the outcome to the GRC within seven working days.

422. **Stage 3:** In case of dissatisfaction of the complainant at stage 2, he/she can approach to GRC stage 3 at PIU level. Here, the GRC is headed by the Project Director. The GRC at PIU level will resolve the complaint/grievance and the agreed action thus determined should be implemented within twenty-one days (if additional time is needed to implement the corrective action, it should be discussed and decided during the meeting). In case of failure to address the complaint, the complainant can approach to final tier, stage 4.
423. **Stage 4:** If the affected person/complainant is still not satisfied with the reply in Stage 3, he or she can pursue judicial proceedings. In such cases, the PIU will also inform the Bank Team of persistent problems and/or where solutions need to be found at higher levels of government. Implementing the GRC's decision will be a contractual binding on the contractor.

9.5.2 Proposed Mechanism for Grievance Redress

424. Under the project the following will be established or appointed to ensure timely and effective handling of grievances:
- A Project Implementation Unit (PIU), which will be responsible to receive, log, and resolve complaints; and,
 - A Grievance Redress Committee (GRC), responsible to oversee the functioning of the PIU as well as the final non-judicial authority on resolving grievances that cannot be resolved by the contractor;
 - Grievance Focal Points (GFPs) having educated people from each community that can be approached by the community members for their grievances against the Project. The GFPs will be provided training by the Project in facilitating grievance redress.

9.6 Proposed Mechanism

425. Details of the proposed mechanism are given below.

9.6.1 PIU – Function and Structure

426. PIU will be set up as part of the Project Management Unit. A senior official with experience in community and public liaison will lead the unit. The assistant will be responsible for coordinating correspondence and preparing documentation work and will assist the senior official. The senior official will be responsible to review all documentation. The PIU will be responsible to receive, log, and resolve grievances. Given that the female community members have restricted mobility outside of their homes, the female PIU staff will be required to undertake visits to the local communities. The frequency of visits will depend on the nature and magnitude of activity in an area and the frequency of grievances.

9.6.2 GRC – Function and Structure- Formal Way

427. The GRC will function as an independent body that will regulate PIU and the grievance redress process.

9.6.3 Operating Principles for PIU

428. The PIU will operate on the principles of transparency, approachability and accountability. To achieve these, the PIU will be required to:

- Be equipped to handle grievances in the local languages.
- Be equipped to work through all possible modes of communication, such as, emails, surface mail and face-to-face meetings at project site or requiring visits.
- Employ female staff, to oversee complaints and issues of the female community members.
- Maintain a log of all grievances, with record of the date and time of the complaint logged and stakeholder information, such as, name, designation and contact details;
- Provide opportunity to the stakeholder to revert with their comments on the proposed plan of action.
- Keep the stakeholder informed of the progress in grievance resolution.
- Obtain stakeholder consent on the mechanism proposed to redress the grievance and document consent, and,
- Maintain confidentiality of the stakeholder, if requested so.

9.6.4 Awareness

429. The stakeholders will be informed of the establishment of the PIU, GRC and GFPs through a short and intensive awareness campaign. Under the awareness campaign, the proponent will share:

- Objective, function and the responsibilities of the PIU, GRC and GFPs;
- Means of accessing the PIU and the mechanics of registering a grievance at the PIU, GRC and GFPs;
- Operating principles of the PIU, GRC and GFPs; and,
- Contact details.
- Additional awareness campaigns may be organized, if necessary.

9.6.5 Complaints Management Register (CMR)

430. Under the GRM, community complaint registers will be maintained at divisional and project level by RE/ARE of CSC and kept at various site offices. All complaints and grievances will be logged in these registers by RE/ARE concerned along with details including date of complaint, name and address of complainant, and description of complaint. The GRC will then fill additional details in the register including the corrective action needed, timeframe for corrective action to be taken, and person/project entity responsible for corrective action. Once the corrective action is implemented, the complainant will be informed and the GRC will document the associated details in the register including the description of action taken, date of action completed, views of the complainant regarding the corrective action, and any residual grievance. The GRM will be operated in a transparent and participatory manner. Complete details of the GRM including its

procedures, actions planned, and action taken will be widely disseminated particularly among the local communities, the GRM registers will remain accessible to communities and other stakeholders, and complete information of the corrective actions taken in response to the grievances will be shared with the stakeholders particularly the complainant and related community.

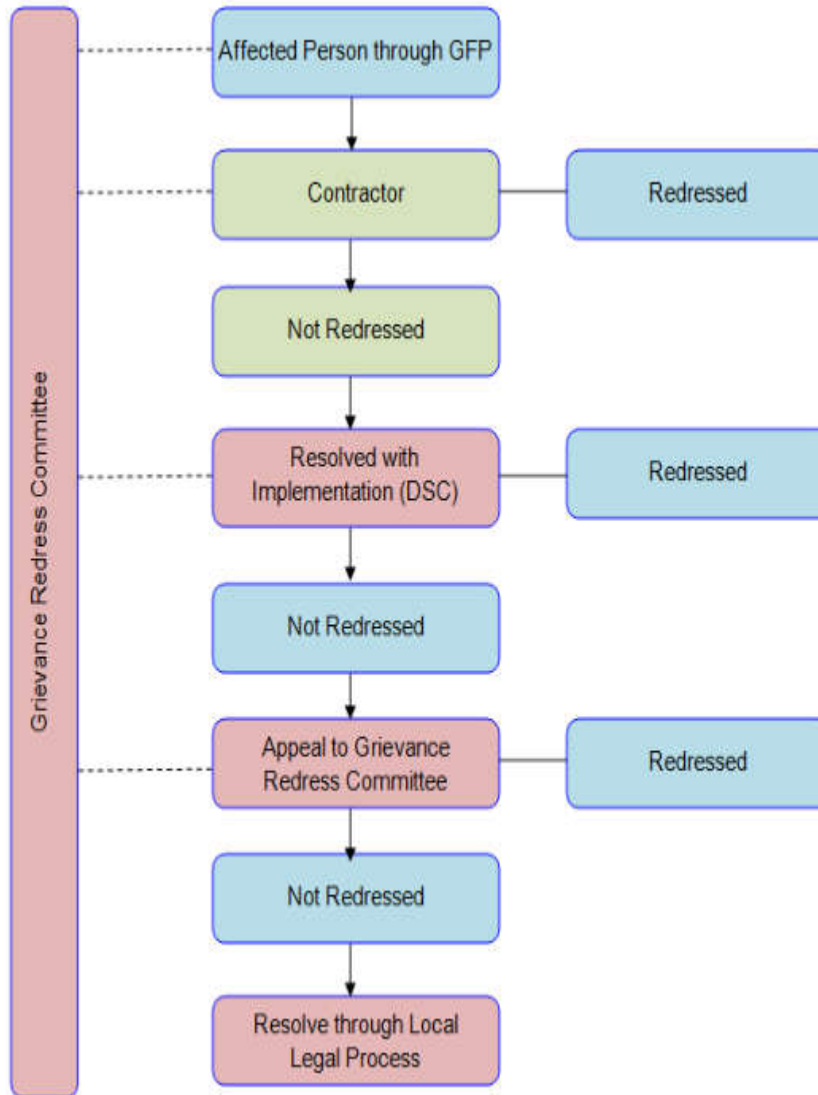


Figure 9-1: Grievance Redress Mechanisms

10 CONCLUSION AND RECOMMENDATIONS

431. The preliminary design, environmental and social surveys, and impact assessments for the proposed project indicate that while there will be some short-term adverse impacts during the construction phase, these impacts are limited in scope, temporary, and can be effectively managed through the mitigation measures outlined in this IEE report. Although there may be some long-term operational impacts, they are not expected to be significant. The Environmental Management Plan will be implemented to mitigate both construction and operational phase impacts, bringing them to an acceptable level.
432. This IEE study concludes that the proposed road project will not lead to significant adverse environmental, social and biodiversity impacts of such nature or magnitude that would require a more detailed report in the form of an Environmental Impact Assessment (EIA). Additionally, a careful implementation of the EMP will ensure that environmental impacts are managed and minimized and the project proponent meets all statutory requirements.
433. Meaningful consultations have been conducted during the pre-construction phase and all concerns of the affected persons and stakeholders have been incorporated in the IEE report. These consultations were represented by key stakeholders. An integrated social and environmental Grievance Redress Mechanism has been formed to continue receiving feedback and complaints, if any, from affected parties and addressing them during the construction stage of project. A summary in English and local language will be distributed to the stakeholders. Additionally, the IEE report and other project-related documents will be accessible on ADB website.
434. Based on findings of IEE study, following is recommended:
- The contractor should prepare the site-specific plans outlined in the Environmental Management Plan, and the supervising consultant will then review and approve these plans.
 - The EMP will be included in the bid document of the contractor along with its budget and eventually become part of the civil works contract (s);

ANNEXURES

Annexure 1 - REA-Rapid environmental assessment

Country/Project Title:	
Sector Division:	

Screening Questions	Yes	No	Remarks
A. Project Siting			
<u>Is the project area adjacent to or within any of the following environmentally sensitive areas?</u>			
<u>Cultural heritage site</u>			
<u>Protected Area</u>			
<u>Wetland</u>			
<u>Mangrove</u>			
<u>Estuarine</u>			
<u>Buffer zone of protected area</u>			
<u>Special area for protecting biodiversity</u>			
B Potential Environmental Impacts Will the Project cause...			
<ul style="list-style-type: none"> ▪ encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries ? 			
<ul style="list-style-type: none"> ▪ encroachment on precious ecology (e.g. sensitive or protected areas) ? 			
<ul style="list-style-type: none"> ▪ alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site ? 			
<ul style="list-style-type: none"> ▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction ? 			
<ul style="list-style-type: none"> ▪ increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing ? 			
<ul style="list-style-type: none"> ▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project construction and operation ? 			
<ul style="list-style-type: none"> ▪ noise and vibration due to blasting and other civil works? 			
<ul style="list-style-type: none"> ▪ dislocation or involuntary resettlement of people? 			
<ul style="list-style-type: none"> ▪ dislocation and compulsory resettlement of people living in right-of-way? 			
<ul style="list-style-type: none"> ▪ disproportionate impacts on the poor, women and children, Indigenous Peoples, or other vulnerable groups? 			
<ul style="list-style-type: none"> ▪ other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress? 			

Screening Questions	Yes	No	Remarks
▪ hazardous driving conditions where construction interferes with pre-existing roads?			
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?			
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?			
▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?			
▪ increased noise and air pollution resulting from traffic volume?			
▪ increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			
▪ community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.			

Project Category Recommendation

1. It is recommended that based on the available project information and subsequent analysis, the project should be placed in:



A Checklist for Preliminary Climate Risk Screening

Country/Project Title:	
Sector:	
Subsector:	
Division/Department:	

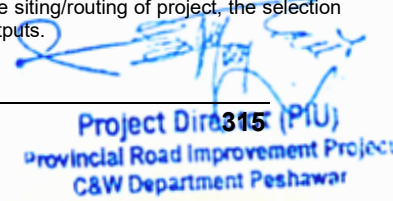
Screening Questions		Score	Remarks ¹⁶
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.) ?		
Materials and Maintenance	Would weather, current, and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current, and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design lifetime?		

Options for answers and corresponding score are provided below:


Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1–4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category.


¹⁶ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.



Annexure 2 - Environmental Monitoring Reports



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AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT


Reference Number:	KPRRDP/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	15-02-2024		
Source:	Ambient Air	Monitoring Instrument:	AQMS-65, Serial # 1310
Road IDs:	BN-3, BN-5, N-BN-1, N-BN-11		

Sr. No.	Road IDs	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		Units			
		(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)
1	BN-3	37.91	0.3	4.57	4.96
2	BN-5	41.54	0.32	5.06	5.31
3	N-BN-1	39.67	0.27	4.83	5.27
4	N-BN-11	32.82	0.16	3.91	4.54
NEQSAA		150 (24 hr)	95 (24 hr)	80 (24 hr)	120 (24 hr)
WHO		45 (24 hr)	64 (24 hr)	25 (24 hrs)	40 (24 hrs)


NEQSAA: National Environmental Quality Standards for Ambient Air
 WHO: World Health organization

Note:

- Selected measurement units were µg/m³ or mg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.




Signature of Analyst



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Environmental Protection Agency (EPA-KPK) Certified


Project Director (PIU)
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 C&W Department Peshawar



NOISE LEVEL MONITORING REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	15-02-2024		
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
Road IDs:	BN-3, BN-5, N-BN-1, N-BN-11		

Sr. No.	Road IDs	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	BN-3	dB(A)	45.68	42.67
2	BN-5		47.33	36.81
3	N-BN-1		43.52	34.95
4	N-BN-11		46.71	40.38
NEQS Noise Standards			55	45
WHO Permissible Noise		70		

- NEQS: National Environmental Quality Standards
 WHO: World Health organization
 Leq: Log Equivalent Continuous Sound Level
 Note:
- Selected measurement units were dB (A) otherwise stated.
 - Quality was assured through self calibration of the instrument.
 - The values were representing of monitoring conditions prevailing during the monitoring hours.
 - The measurements were carried out on client request.
 - The client is responsible lawful usage of reported data in future.
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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	15-02-2024		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods


Parameters	Units	WHO	NDWQS	Results	
				BN-3	BN-5
pH	--	6.5-8.5	6.5-8.5	7.6	7.81
Temperature	°C	---	---	11	13
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	3	5
Turbidity	NTU	<5	<5	4.2	3.9
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	326	376
Total Hardness as CaCO ₃	mg/L	-----	<500	268	262
Nitrate (NO ₃)	mg/L	50	≤50	0.9	1.2
Nitrite (NO ₂)	mg/L	3	≤3	0.006	0.03
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	0	0.006
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	79	72
Chlorine	mg/L		0.5-1.5	0.4	0.31
Lead (Pb)	mg/L	0.01	≤0.05	0.001	0.008
Fluoride	mg/L	1.5	≤1.5	0.58	0.47
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.057	0.19
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.05	0.18
Zinc (Zn)	mg/L	3	5	1.09	1.2
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 ml.	Must not be detectable in any 100 ml sample	0 Number/100 ml.	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards
 N.D.: Not Detected
 WHO: World Health organization

Signature of Analyst: 


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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	15-02-2024		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				N-BN-1	N-BN-11
pH	--	6.5-8.5	6.5-8.5	7.5	7.7
Temperature	°C	---	---	14	16
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	4	5
Turbidity	NTU	<5	<5	4	4.2
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	326	372
Total Hardness as CaCO ₃	mg/L	---	<500	195	243
Nitrate (NO ₃)	mg/L	50	≤50	1	1.3
Nitrite (NO ₂)	mg/L	3	≤3	0.004	0.05
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	83	89.7
Chlorine	mg/L	---	0.5-1.5	0.57	0.51
Lead (Pb)	mg/L	0.01	≤0.05	0.002	0.004
Fluoride	mg/L	1.5	≤1.5	0.56	0.49
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.052	0.16
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.02	0.21
Zinc (Zn)	mg/L	3	5	1.07	1.08
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards
 N.D.: Not Detected
 WHO: World Health Organization

Signature of Analyst



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 C&W Department Peshawar



Integrated Environment Laboratory

AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT



Reference Number:	KPRRD/ENV/16-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	20-03-2024	Monitoring Instrument:	AQMS65, Serial # 1310
Source:	Ambient Air		
Road/Bridges IDS	BTG-16, BTG-2, BTG-BR-4		

Sr. No.	Road/Bridges IDs	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		Units			
		(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)
1	BTG-16	34.94	0.11	1.71	2.8
2	BTG-2	36.57	0.13	2.2	3.15
3	BTG-BR-4	36.7	0.08	1.97	3.11
	NEQSAA	150 (24 hr)	95 (24 hr)	80 (24 hr)	120 (24 hr)
	WHO	45 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air
 WHO: World Health organization
 Note:

- Selected measurement units were µg/m³ or mg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

[Signature]
 Signature of Analyst



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 C&W Department Peshawar



NOISE LEVEL MONITORING REPORT

Reference Number	KPRRD/ENV/16-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	20-03-2024	Monitoring Instrument:	Noise Meter-IEC651-Type-2
Source:	Ambient Noise		
Road/Bridges IDS	BTG-16, BTG-2, BTG-BR-4		

Sr. No.	Road/Bridges IDs	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	BTG-16	dB(A)	44.93	35.92
2	BTG-2		42.98	32.06
3	BTG-BR-4		39.57	31.2
NEQS Noise Standards			55	45
WHO Permissible Noise			70	

- NEQS:** National Environmental Quality Standards
WHO: World Health organization
Leq: Log Equivalent Continuous Sound Level
Note:
 - Selected measurement units were dB (A) otherwise stated.
 - Quality was assured through self calibration of the instrument.
 - The values were representing of monitoring conditions prevailing during the monitoring hours.
 - The measurements were carried out on client request.
 - The client is responsible lawful usage of reported data in future.
 - The report is not valid for court.


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 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/16-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	20-03-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				BTG-16	BTG-2
pH	--	6.5-8.5	6.5-8.5	7.29	7.04
Temperature	°C	—	—	16	15
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	8	7
Turbidity	NTU	<5	<5	4	4.3
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	326	342
Total Hardness as CaCO ₃	mg/L	—	<500	254	227
Nitrate (NO ₃)	mg/L	50	≤50	2.42	2.68
Nitrite (NO ₂)	mg/L	3	≤3	0.026	0.036
Arsenic (As)	mg/L	0.01	≤0.05	N.D	N.D
Nickel (Ni)	mg/L	0.02	≤0.02	N.D	N.D
Antimony (Sb)	mg/L	0.005	<0.005	N.D	N.D
Chloride (Cl)	mg/L	250	<250	90	97
Chlorine	mg/L	—	0.5-1.5	0.5	0.54
Lead (Pb)	mg/L	0.01	≤0.05	0.003	0.005
Fluoride	mg/L	1.5	≤1.5	0.41	0.45
Aluminum	mg/L	≤ 0.2	≤0.2	N.D	N.D
Manganese (Mn)	mg/L	0.5	≤0.5	N.D	N.D
Cadmium (Cd)	mg/L	0.003	0.01	N.D	N.D
Barium (Ba)	mg/L	0.3	0.7	0.17	0.24
Mercury (Hg)	mg/L	0.001	≤0.001	N.D	N.D
Copper (Cu)	mg/L	2	2	0.03	0.037
Zinc (Zn)	mg/L	3	5	1.06	1.12
Boron (B)	mg/L	0.3	0.3	N.D	N.D
Chromium (Cr)	mg/L	0.05	≤0.05	N.D	N.D
Selenium (Se)	mg/L	0.01	0.01	N.D	N.D
Cyanide (CN)	mg/L	0.07	≤0.05	N.D	N.D
E-Coil	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0
Total Coliform	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

Signature of Analyst 


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 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number:	KPRRD/ENV/16-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	20-03-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results
				BTG-BR-4
pH	--	6.5-8.5	6.5-8.5	7.53
Temperature	°C	---	---	14
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	8
Turbidity	NTU	<5	<5	3.6
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	366
Total Hardness as CaCO ₃	mg/L	---	<500	301
Nitrate (NO ₃)	mg/L	50	≤50	3.16
Nitrite (NO ₂)	mg/L	3	≤3	0.025
Arsenic (As)	mg/L	0.01	≤0.05	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.
Chloride (Cl)	mg/L	250	<250	75
Chlorine	mg/L	---	0.5-1.5	0.39
Lead (Pb)	mg/L	0.01	≤0.05	0.0025
Fluoride	mg/L	1.5	≤1.5	0.37
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.19
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.
Copper (Cu)	mg/L	2	2	0.036
Zinc (Zn)	mg/L	3	5	0.78
Boron (B)	mg/L	0.3	0.3	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health Organisation

Signature of Analyst

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Integrated Environment Laboratory

AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT



Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	30-03-2024	Monitoring Instrument:	AQMS65, Serial # 1310
Source:	Ambient Air		
Road/Bridge IDS	N-BUN-2, BUN-11, BUN-9, T-1, N-BUN-BR-90, N-BUN-BR-92, BUN-BR-78, BUN-BR-87, BUN-BR-89		

Sr. No.	Road/Bridge IDs	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		Units			
		(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)
1	N-BUN-2	33.18	0.14	2.21	2.07
2	BUN-11	36.81	0.16	2.63	2.38
3	BUN-9	34.94	0.11	2.75	2.23
4	T-1	35.04	0.26	4.33	4.72
5	N-BUN-BR-90	38.67	0.28	4.82	5.07
6	N-BUN-BR-92	37.23	0.21	3.61	4.23
7	BUN-BR-78	39.8	0.25	4.64	4.59
8	BUN-BR-87	41.56	0.29	4.87	4.8
9	BUN-BR-89	37.92	0.29	5.97	5.72
NEQSAA		150 (24 hr)	06 (24 hr)	80 (24 hr)	120 (24 hr)
WHO		45 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health organization

Note:


- Selected measurement units were µg/m³ or mg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst: 


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NOISE LEVEL MONITORING REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	30-03-2024	Monitoring Instrument:	Noise Meter-IEC651-Type-2
Source:	Ambient Noise		
Road/Bridge IDS	N-BUN-2, BUN-11, BUN-9, T-1, N-BUN-BR-90, N-BUN-BR-92, BUN-BR-78, BUN-BR-87, BUN-BR-89		

Sr. No.	Road IDs	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	N-BUN-2	dB(A)	48.76	39.34
2	BUN-11		46.81	33.48
3	BUN-9		43.4	31.62
4	T-1		50.89	37.05
5	N-BUN-BR-90		41.02	28.76
6	N-BUN-BR-92		42.36	33.22
	BUN-BR-78		49.3	40.14
	BUN-BR-87		46.59	35.66
	BUN-BR-89		47.14	38.85
NEQS Noise Standards			55	45
WHO Permissible Noise			70	

NEQS: National Environmental Quality Standards
 WHO: World Health organization
 Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Reporting Date:	30-03-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				N-BUN-2	BUN-11
pH	--	6.5-8.5	6.5-8.5	7.4	7.2
Temperature	°C	---	---	12	14
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	5	4
Turbidity	NTU	<5	<5	3.3	4.2
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	339	374
Total Hardness as CaCO ₃	mg/L	---	<500	294	323
Nitrate (NO ₃)	mg/L	50	≤50	0.89	0.38
Nitrite (NO ₂)	mg/L	3	≤3	0.09	0.026
Arsenic (As)	mg/L	0.01	≤0.05	N.D	N.D
Nickel (Ni)	mg/L	0.02	≤0.02	N.D	N.D
Antimony (Sb)	mg/L	0.005	<0.005	N.D	N.D
Chloride (Cl)	mg/L	250	<250	81.5	99.5
Chlorine	mg/L	---	0.5-1.5	0.45	0.44
Lead (Pb)	mg/L	0.01	≤0.05	0.009	0.003
Fluoride	mg/L	1.5	≤1.5	0.82	0.58
Aluminum	mg/L	≤ 0.2	≤0.2	N.D	N.D
Manganese (Mn)	mg/L	0.5	≤0.5	N.D	N.D
Cadmium (Cd)	mg/L	0.003	0.01	N.D	N.D
Barium (Ba)	mg/L	0.3	0.7	0.11	0.22
Mercury (Hg)	mg/L	0.001	≤0.001	N.D	N.D
Copper (Cu)	mg/L	2	2	0.05	0.05
Zinc (Zn)	mg/L	3	5	0.36	0.61
Boron (B)	mg/L	0.3	0.3	N.D	N.D
Chromium (Cr)	mg/L	0.05	≤0.05	N.D	N.D
Selenium (Se)	mg/L	0.01	0.01	N.D	N.D
Cyanide (CN)	mg/L	0.07	≤0.05	N.D	N.D
E-Coli	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0
Total Coliform	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0


NDWQS: National Drinking Water Quality Standards
 N.D: Not Detected
 WHO: World Health organization

Signature of Analyst: 


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 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	30-03-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				BUN-9	T-1
pH	—	6.5-8.5	6.5-8.5	7.41	7.1
Temperature	°C	—	—	14	13
Taste & Odor	—	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	5	4
Turbidity	NTU	<5	<5	3.9	4
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	373	376
Total Hardness as CaCO ₃	mg/L	—	<500	317	304
Nitrate (NO ₃)	mg/L	50	≤50	0.92	0.44
Nitrite (NO ₂)	mg/L	3	≤3	0.05	0.024
Arsenic (As)	mg/L	0.01	≤0.05	N.D	N.D
Nickel (Ni)	mg/L	0.02	≤0.02	N.D	N.D
Antimony (Sb)	mg/L	0.005	<0.005	N.D	N.D
Chloride (Cl)	mg/L	250	<250	112	105
Chlorine	mg/L	—	0.5-1.5	0.35	0.61
Lead (Pb)	mg/L	0.01	≤0.05	0.01	0.004
Fluoride	mg/L	1.5	≤1.5	0.47	0.56
Aluminum	mg/L	≤ 0.2	≤0.2	N.D	N.D
Manganese (Mn)	mg/L	0.5	≤0.5	N.D	N.D
Cadmium (Cd)	mg/L	0.003	0.01	N.D	N.D
Barium (Ba)	mg/L	0.3	0.7	0.14	0.26
Mercury (Hg)	mg/L	0.001	≤0.001	N.D	N.D
Copper (Cu)	mg/L	2	2	0.16	0.02
Zinc (Zn)	mg/L	3	5	0.72	0.59
Boron (B)	mg/L	0.3	0.3	N.D	N.D
Chromium (Cr)	mg/L	0.05	≤0.05	N.D	N.D
Selenium (Se)	mg/L	0.01	0.01	N.D	N.D
Cyanide (CN)	mg/L	0.07	≤0.05	N.D	N.D
E-Coli	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0
Total Coliform	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

Signature of Analyst:



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 Provincial Road Improvement Project
 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	30-03-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				N-BUN-BR-90	N-BUN-BR-92
pH	—	6.5-8.5	6.5-8.5	7.3	7.1
Temperature	°C	—	—	13	14
Taste & Odor	—	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	5	6
Turbidity	NTU	<5	<5	4.2	4
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	420	411
Total Hardness as CaCO ₃	mg/L	—	<500	306	317
Nitrate (NO ₃)	mg/L	50	≤50	0.73	0.53
Nitrite (NO ₂)	mg/L	3	≤3	0.07	0.08
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	98	104
Chlorine	mg/L	—	0.5-1.5	0.55	0.2
Lead (Pb)	mg/L	0.01	≤0.05	0.006	0.007
Fluoride	mg/L	1.5	≤1.5	0.49	0.65
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.12	0.23
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.21	0.05
Zinc (Zn)	mg/L	3	5	0.6	0.8
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D.: Not Detected

WHO: World Health Organization

Signature of Analyst

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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	30-03-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				BUN-BR-78	BUN-BR-87
pH	—	6.5-8.5	6.5-8.5	7.4	7.22
Temperature	°C	—	—	14	13
Taste & Odor	—	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	≤15	6	5
Turbidity	NTU	<5	<5	2.1	3
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	341	359
Total Hardness as CaCO ₃	mg/L	—	<500	311	322
Nitrate (NO ₃)	mg/L	50	≤50	0.49	0.6
Nitrite (NO ₂)	mg/L	3	≤3	0.07	0.13
Arsenic (As)	mg/L	0.01	≤0.05	N.D	N.D
Nickel (Ni)	mg/L	0.02	≤0.02	N.D	N.D
Antimony (Sb)	mg/L	0.005	<0.005	N.D	N.D
Chloride (Cl)	mg/L	250	<250	111	120
Chlorine	mg/L	—	0.5-1.5	0.16	0.12
Lead (Pb)	mg/L	0.01	≤0.05	0.003	0.005
Fluoride	mg/L	1.5	≤1.5	0.81	0.57
Aluminum	mg/L	≤ 0.2	≤0.2	N.D	N.D
Manganese (Mn)	mg/L	0.5	≤0.5	N.D	N.D
Cadmium (Cd)	mg/L	0.003	0.01	N.D	N.D
Barium (Ba)	mg/L	0.3	0.7	0.18	0.2
Mercury (Hg)	mg/L	0.001	≤0.001	N.D	N.D
Copper (Cu)	mg/L	2	2	0.03	0.001
Zinc (Zn)	mg/L	3	5	0.56	0.73
Boron (B)	mg/L	0.3	0.3	N.D	N.D
Chromium (Cr)	mg/L	0.05	≤0.05	N.D	N.D
Selenium (Se)	mg/L	0.01	0.01	N.D	N.D
Cyanide (CN)	mg/L	0.07	≤0.05	N.D	N.D
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected


WHO: World Health organization

Signature of Analyst 


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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	30-03-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results
				BUN-BR-89
pH	--	6.5-8.5	6.5-8.5	7.17
Temperature	°C	---	---	14
Taste & Odor	--	Non- Objectionable	Non-Objectionable	Non Objectionable
Color	TCU	≤ 15	<15	4
Turbidity	NTU	<5	<5	3.9
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	369
Total Hardness as CaCO ₃	mg/L	---	<500	308
Nitrate (NO ₃)	mg/L	50	≤50	0.75
Nitrite (NO ₂)	mg/L	3	≤3	0.09
Arsenic (As)	mg/L	0.01	≤0.05	N.D
Nickel (Ni)	mg/L	0.02	≤0.02	N.D
Antimony (Sb)	mg/L	0.005	<0.005	N.D
Chloride (Cl)	mg/L	250	<250	116
Chlorine	mg/L	---	0.5-1.5	0.19
Lead (Pb)	mg/L	0.01	≤0.05	0.009
Fluoride	mg/L	1.5	≤1.5	0.54
Aluminum	mg/L	≤ 0.2	≤0.2	N.D
Manganese (Mn)	mg/L	0.5	≤0.5	N.D
Cadmium (Cd)	mg/L	0.003	0.01	N.D
Barium (Ba)	mg/L	0.3	0.7	0.24
Mercury (Hg)	mg/L	0.001	≤0.001	N.D
Copper (Cu)	mg/L	2	2	0.01
Zinc (Zn)	mg/L	3	5	0.36
Boron (B)	mg/L	0.3	0.3	N.D
Chromium (Cr)	mg/L	0.05	≤0.05	N.D
Selenium (Se)	mg/L	0.01	0.01	N.D
Cyanide (CN)	mg/L	0.07	≤0.05	N.D
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

[Signature]
Signature of Analyst



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Provincial Road Improvement Project
C&W Department Peshawar



Integrated Environment Laboratory

AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT



Reference Number	KPRRD/ENV/02-2024		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Monitoring Date:	05-02-2024	Reporting Date:	
Source:	Ambient Air	Monitoring Instrument:	AQMS85, Serial # 1310
Road IDS	CHR-9, CHR-10		

Sr. No.	Road IDs	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		Units			
		($\mu\text{g}/\text{m}^3$)	(mg/m^3)	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)
1	CHR-9	35.97	0.26	3.09	3.51
2	CHR-10	37.23	0.29	3.14	3.6
NEQSAA		150 (24 hr)	05 (24 hr)	80 (24 hr)	120 (24 hr)
WHO		45 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health organization

Note:

- Selected measurement units were $\mu\text{g}/\text{m}^3$ or mg/m^3 otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

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NOISE LEVEL MONITORING REPORT

Reference Number	KPRRD/ENV/02-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	05-02-2024	Monitoring Instrument:	Noise Meter-IEC651-Type-2
Source:	Ambient Noise		
Road IDs:	CHR-9, CHR-10		

Sr. No.	Road IDs	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	CHR-9	dB(A)	46.35	39.28
2	CHR-10		49.62	41.99
NEQS Noise Standards			55	45
WHO Permissible Noise			70	

NEQS: National Environmental Quality Standards
 WHO: World Health organization
 Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.



 Signature of Analyst:



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WATER ANALYSIS REPORT

Reference Number	KPRRDP/ENV/02-2024				
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project				
Reporting Date:	05-02-2024	Reporting Date:			
Source:	Drinking Water	Sampling Done by:	Analyst		
		Analysis Method:	APHA/USEPA Standard Methods		

Parameters	Units	WHO	NDWQS	Results	
				CHR-9	CHR-10
pH	--	6.5-8.5	6.5-8.5	7.53	7.49
Temperature	°C	---	---	15	14
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	4	5
Turbidity	NTU	<5	<5	3.8	4.1
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	307	321
Total Hardness as CaCO ₃	mg/L	---	<500	205	178
Nitrate (NO ₃)	mg/L	50	≤50	2.04	2.3
Nitrite (NO ₂)	mg/L	3	≤3	0.004	0.008
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	128	135
Chlorine	mg/L	---	0.5-1.5	0.51	0.6
Lead (Pb)	mg/L	0.01	≤0.05	0.001	0.003
Fluoride	mg/L	1.5	≤1.5	0.31	0.27
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.18	0.15
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.13	0.1
Zinc (Zn)	mg/L	3	5	0.77	0.9
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D.: Not Detected

WHO: World Health organization

Signature of Analyst



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AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT



Reference Number	KPRRD/ENV/65-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	29-11-2023	Monitoring Instrument:	AQMS65, Serial # 1310
Source:	Ambient Air		
Road/Bridges IDS	N-CHT-2, N-CHT-9, RRD_UCH_NR1, N-CHT-1, N-CHT-3, N-CHT-4, N-CHT-5, N-CHT-6, N-CHT-7, N-CHT-8, CHT-BR-1		

Sr. No.	Road/Bridges IDs	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		Units			
		(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)
1	N-CHT-2	36.05	0.18	2.45	2.31
2	N-CHT-9	39.68	0.2	2.87	2.82
3	RRD_UCH_NR1	37.81	0.15	2.99	2.47
4	N-CHT-1	37.91	0.3	4.57	4.96
5	N-CHT-3	41.54	0.32	5.06	5.31
6	N-CHT-4	40.1	0.25	3.85	4.47
7	N-CHT-5	42.67	0.29	4.88	4.83
8	N-CHT-6	44.43	0.33	5.11	5.04
9	N-CHT-7	40.79	0.33	6.21	5.96
10	N-CHT-8	44.42	0.35	6.7	6.31
11	CHT-BR-1	42.55	0.3	6.47	6.27
NEQSAA		150 (24 hr)	06 (24 hr)	80 (24 hr)	120 (24 hr)
WHO		45 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health organization

Note:

- Selected measurement units were µg/m³ or mg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
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NOISE LEVEL MONITORING REPORT

Reference Number	KPRRDP/ENV/65-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	29-11-2023	Monitoring Instrument:	Noise Meter-IEC651-Type-2
Source:	Ambient Noise		
Road/Bridges IDS	N-CHT-2, N-CHT-9, RRD_UCH_NR1, N-CHT-1, N-CHT-3, N-CHT-4, N-CHT-5, N-CHT-6, N-CHT-7, N-CHT-8, CHT-BR-1		

Sr. No.	Road/Bridges IDs	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	N-CHT-2	dB(A)	52.7	43.28
2	N-CHT-9		50.75	37.42
3	RRD_UCH_NR1		47.34	35.55
4	N-CHT-1		54.83	40.99
5	N-CHT-3		44.96	32.7
6	N-CHT-4		46.3	37.16
7	N-CHT-5		53.24	44.08
8	N-CHT-6		51.66	42.23
9	N-CHT-7		51.68	42.67
10	N-CHT-8		49.73	36.81
11	CHT-BR-1		46.32	34.95
NEQS Noise Standards			55	45
WHO Permissible Noise			70	

NEQS: National Environmental Quality Standards
WHO: World Health organization
Leq: Log Equivalent Continuous Sound Level
Note:

- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/65-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	29-11-2023	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				N-CHT-2	N-CHT-9
pH	--	6.5-8.5	6.5-8.5	7.7	7.5
Temperature	°C	---	---	9	10
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	2	3
Turbidity	NTU	<5	<5	2.5	2.3
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	381	372
Total Hardness as CaCO ₃	mg/L	---	<500	348	359
Nitrate (NO ₃)	mg/L	50	≤50	0.25	0.05
Nitrite (NO ₂)	mg/L	3	≤3	0.05	0.05
Arsenic (As)	mg/L	0.01	≤0.05	N.D	N.D
Nickel (Ni)	mg/L	0.02	≤0.02	N.D	N.D
Antimony (Sb)	mg/L	0.005	<0.005	N.D	N.D
Chloride (Cl)	mg/L	250	<250	113	120
Chlorine	mg/L	---	0.5-1.5	0.55	0.2
Lead (Pb)	mg/L	0.01	≤0.05	0.006	0.007
Fluoride	mg/L	1.5	≤1.5	0.49	0.65
Aluminum	mg/L	≤ 0.2	≤0.2	N.D	N.D
Manganese (Mn)	mg/L	0.5	≤0.5	N.D	N.D
Cadmium (Cd)	mg/L	0.003	0.01	N.D	N.D
Barium (Ba)	mg/L	0.3	0.7	0.12	0.23
Mercury (Hg)	mg/L	0.001	≤0.001	N.D	N.D
Copper (Cu)	mg/L	2	2	0.21	0.05
Zinc (Zn)	mg/L	3	5	0.6	0.6
Boron (B)	mg/L	0.3	0.3	N.D	N.D
Chromium (Cr)	mg/L	0.05	≤0.05	N.D	N.D
Selenium (Se)	mg/L	0.01	0.01	N.D	N.D
Cyanide (CN)	mg/L	0.07	≤0.05	N.D	N.D
E-Coli	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health Organization

[Signature]
Signature of Analyst



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C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number:	KPRRD/ENV/65-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	29-11-2023	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				RRD_UCH_NR1	N-CHT-1
pH	--	6.5-8.5	6.5-8.5	7.62	7.57
Temperature	°C	---	---	9	10
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	≤ 15	2	1
Turbidity	NTU	< 5	< 5	1.3	2.2
Total Dissolved Solids (TDS)	mg/L	< 1000	< 1000	344	354
Total Hardness as CaCO ₃	mg/L	-----	< 500	364	350
Nitrate (NO ₃)	mg/L	50	≤ 50	0.12	0.27
Nitrite (NO ₂)	mg/L	3	≤ 3	0.11	0.07
Arsenic (As)	mg/L	0.01	≤ 0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤ 0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	< 0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	< 250	125	114
Chlorine	mg/L		0.5-1.5	0.12	0.19
Lead (Pb)	mg/L	0.01	≤ 0.05	0.005	0.009
Fluoride	mg/L	1.5	≤ 1.5	0.57	0.54
Aluminum	mg/L	≤ 0.2	≤ 0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤ 0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.2	0.24
Mercury (Hg)	mg/L	0.001	≤ 0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.001	0.01
Zinc (Zn)	mg/L	3	5	0.73	0.36
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤ 0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤ 0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D.: Not Detected

WHO: World Health Organization

Signature of Analyst:



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Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/65-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	29-11-2023		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				N-CHT-3	N-CHT-4
pH	--	6.5-8.5	6.5-8.5	7.4	7.2
Temperature	°C	---	---	13	13
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	5	4
Turbidity	NTU	<5	<5	2.6	4.3
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	334	328
Total Hardness as CaCO ₃	mg/L	---	<500	237	214
Nitrate (NO ₃)	mg/L	50	≤50	1.84	2.48
Nitrite (NO ₂)	mg/L	3	≤3	0.37	0.16
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	124	148
Chlorine	mg/L		0.5-1.5	0.56	0.49
Lead (Pb)	mg/L	0.01	≤0.05	0.029	0.0029
Fluoride	mg/L	1.5	≤1.5	0.29	0.24
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.2	0.19
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.16	0.2
Zinc (Zn)	mg/L	3	5	0.82	0.85
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0
Total Coliform	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health Organization

Signature of Analyst:



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 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/65-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	29-11-2023		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				N-CHT-5	N-CHT-6
pH	--	6.5-8.5	6.5-8.5	7.59	7.4
Temperature	°C	---	---	12	12
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non Objectionable	Non Objectionable
Color	TCU	≤ 15	<15	6	7
Turbidity	NTU	<5	<5	4.1	3.4
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	318	342
Total Hardness as CaCO ₃	mg/L	---	<500	251	243
Nitrate (NO ₃)	mg/L	50	≤50	2.6	3.08
Nitrite (NO ₂)	mg/L	3	≤3	0.028	0.015
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	0	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	116	94
Chlorine	mg/L		0.5-1.5	0.52	0.37
Lead (Pb)	mg/L	0.01	≤0.05	0.004	0
Fluoride	mg/L	1.5	≤1.5	0.41	0.33
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.062	0.046
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.017	0.016
Zinc (Zn)	mg/L	3	5	1.1	0.73
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D.: Not Detected

WHO: World Health Organisation

Signature of Analyst: 


FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Environmental Protection Agency (EPA-KPK) Certified


Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/65-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	29-11-2023		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				N-CHT-7	N-CHT-8
pH	--	6.5-8.5	6.5-8.5	7.6	7.68
Temperature	°C	---	---	14	12
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	4	5
Turbidity	NTU	<5	<5	2.1	2.4
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	368	372
Total Hardness as CaCO ₃	mg/L	---	<500	294	283
Nitrate (NO ₃)	mg/L	50	≤50	3.16	2.07
Nitrite (NO ₂)	mg/L	3	≤3	0.029	0.25
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	0.06
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	91	102
Chlorine	mg/L	---	0.5-1.5	0.45	0.3
Lead (Pb)	mg/L	0.01	≤0.05	0	0
Fluoride	mg/L	1.5	≤1.5	0.57	0.2
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.082	0.18
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.019	0.16
Zinc (Zn)	mg/L	3	5	1.15	0.79
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	≤0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D.: Not Detected

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Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/65-2023		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Reporting Date:	29-11-2023	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results
				CHT-BR-1
pH	--	6.5-8.5	6.5-8.5	7.63
Temperature	°C	---	---	10
Taste & Odor	--	Non- Objectionable	Non-Objectionable	Non Objectionable
Color	TCU	≤ 15	<15	4
Turbidity	NTU	<5	<5	1.9
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	304
Total Hardness as CaCO ₃	mg/L	-----	<500	238
Nitrate (NO ₃)	mg/L	50	≤50	2.4
Nitrite (NO ₂)	mg/L	3	≤3	0.016
Arsenic (As)	mg/L	0.01	≤0.05	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	0
Antimony (Sb)	mg/L	0.005	<0.005	N.D.
Chloride (Cl)	mg/L	250	<250	109
Chlorine	mg/L		0.5-1.5	0.48
Lead (Pb)	mg/L	0.01	≤0.05	0.002
Fluoride	mg/L	1.5	≤1.5	0.37
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.041
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.
Copper (Cu)	mg/L	2	2	0.01
Zinc (Zn)	mg/L	3	5	1.04
Boron (B)	mg/L	0.3	0.3	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

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 Provincial Road Improvement Project
 C&W Department Peshawar



Integrated Environment Laboratory

AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT



Reference Number	KPRRD/ENV/47-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	18-01-2024	Monitoring Instrument:	AQMS65, Serial # 1310
Source:	Ambient Air		
Road/Bridges IDS	DRL-35, T-30, T-31, DRL-4, T-3, RRD-DRL-NR-1, DRL-BR-54, DRL-BR-61, DRL-BR-62		

Sr. No.	Road/Bridges IDs	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		Units			
		($\mu\text{g}/\text{m}^3$)	(mg/m^3)	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)
1	DRL-35	25.8	0.12	1.92	1.69
2	T-30	29.43	0.08	2.34	1.31
3	T-31	27.56	0.03	2.46	1.16
4	DRL-4	27.66	0.18	2.62	1.65
5	T-3	31.29	0.2	3.11	2
6	RRD-DRL-NR-1	29.85	0.13	1.9	1.16
7	DRL-BR-54	32.42	0.17	2.93	1.52
8	DRL-BR-61	34.18	0.21	3.16	1.73
9	DRL-BR-62	30.54	0.21	2.87	2.05
	NEQSAA	150 (24 hr)	05 (24 hr)	80 (24 hr)	120 (24 hr)
	WHO	45 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health organization

Note:

- Selected measurement units were $\mu\text{g}/\text{m}^3$ or mg/m^3 otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.


Signature of Analyst:  

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NOISE LEVEL MONITORING REPORT

Reference Number	KPRRD/ENV/47-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	18-01-2024	Monitoring Instrument:	Noise Meter-IEC651-Type-2
Source:	Ambient Noise		
Road/Bridges IDs	DRL-35, T-30, T-31, DRL-4, T-3, RRD-DRL-NR-1, DRL-BR-54, DRL-BR-61, DRL-BR-62		

Sr. No.	Road/Bridges IDs	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	DRL-35	dB(A)	42.88	33.46
2	T-30		40.93	27.6
3	T-31		37.52	25.74
4	DRL-4		45.01	31.17
5	T-3		35.14	22.88
6	RRD_DRL_NR_1		36.48	27.34
	DRL-BR-54		43.42	34.26
	DRL-BR-61		40.59	32.41
	DRL-BR-62		42.76	35.85
NEQS Noise Standards			55	45
WHO Permissible Noise			70	

NEQS: National Environmental Quality Standards
 WHO: World Health organization
 Leq: Log Equivalent Continuous Sound Level

Note:


- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/47-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	18-01-2024		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				DRL-35	T-30
pH	--	6.5-8.5	6.5-8.5	7.5	7.3
Temperature	°C	---	---	8	10
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	6	8
Turbidity	NTU	<5	<5	1.3	2.6
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	317	328
Total Hardness as CaCO ₃	mg/L	---	<500	342	355
Nitrate (NO ₃)	mg/L	50	≤50	0.29	0.57
Nitrite (NO ₂)	mg/L	3	≤3	0.069	0.005
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	148.5	161
Chlorine	mg/L		0.5-1.5	0.61	0.6
Lead (Pb)	mg/L	0.01	≤0.05	0.006	0
Fluoride	mg/L	1.5	≤1.5	0.54	0.3
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.24	0.16
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.032	0.052
Zinc (Zn)	mg/L	3	5	0.26	0.51
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D.: Not Detected

WHO: World Health organization

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WATER ANALYSIS REPORT

Reference Number:	KPRRD/ENV/47-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	18-01-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				T-31	DRL-4
pH	—	6.5-8.5	6.5-8.5	7.51	7.2
Temperature	°C	—	—	10	9
Taste & Odor	—	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	6	7
Turbidity	NTU	<5	<5	2.3	2.4
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	351	330
Total Hardness as CaCO ₃	mg/L	—	<500	349	336
Nitrate (NO ₃)	mg/L	50	≤50	0.39	0.41
Nitrite (NO ₂)	mg/L	3	≤3	0.029	0.003
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	154	147
Chlorine	mg/L	—	0.5-1.5	0.51	0.77
Lead (Pb)	mg/L	0.01	≤0.05	0.007	0.001
Fluoride	mg/L	1.5	≤1.5	0.19	0.28
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.28	0.14
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.182	0.022
Zinc (Zn)	mg/L	3	5	0.62	0.49
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0
Total Coliform	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization


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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/47-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	18-01-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				T-3	RRD-DRL-NR1
pH	--	6.5-8.5	6.5-8.5	7.4	7.2
Temperature	°C	---	---	9	10
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	6	7
Turbidity	NTU	<5	<5	2.6	2.4
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	374	365
Total Hardness as CaCO ₃	mg/L	---	<500	338	349
Nitrate (NO ₃)	mg/L	50	≤50	0.25	0.41
Nitrite (NO ₂)	mg/L	3	≤3	0.049	0.059
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	153	160
Chlorine	mg/L	---	0.5-1.5	0.71	0.36
Lead (Pb)	mg/L	0.01	≤0.05	0.003	0.004
Fluoride	mg/L	1.5	≤1.5	0.21	0.37
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.25	0.2
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.212	0.052
Zinc (Zn)	mg/L	3	5	0.5	0.5
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

Signature of Analyst:



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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/47-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	18-01-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				DRL-BR-54	DRL-BR-61
pH	--	6.5-8.5	6.5-8.5	7	7.32
Temperature	°C	---	---	10	9
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	7	8
Turbidity	NTU	<5	<5	0.5	1.4
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	319	337
Total Hardness as CaCO ₃	mg/L	---	<500	343	354
Nitrate (NO ₃)	mg/L	50	≤50	0.49	0.38
Nitrite (NO ₂)	mg/L	3	≤3	0.049	0.109
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	169	165
Chlorine	mg/L	---	0.5-1.5	0.32	0.28
Lead (Pb)	mg/L	0.01	≤0.05	0	0.002
Fluoride	mg/L	1.5	≤1.5	0.53	0.29
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.22	0.26
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.032	0.003
Zinc (Zn)	mg/L	3	5	0.46	0.63
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliforms	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D.: Not Detected

WHO: World Health Organization

Signature of Analyst



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Project Director (PIU)
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WATER ANALYSIS REPORT

Reference Number	KPRRDP/ENV/47-2024		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Reporting Date:	18-01-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results
				DRL-BR-62
pH	--	6.5-8.5	6.5-8.5	7.27
Temperature	°C	---	---	10
Taste & Odor	--	Non- Objectionable	Non-Objectionable	Non Objectionable
Color	TCU	≤ 15	<15	6
Turbidity	NTU	<5	<5	2.3
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	347
Total Hardness as CaCO ₃	mg/L	-----	<500	340
Nitrate (NO ₃)	mg/L	50	≤50	0.25
Nitrite (NO ₂)	mg/L	3	≤3	0.088
Arsenic (As)	mg/L	0.01	≤0.05	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.
Chloride (Cl)	mg/L	250	<250	154
Chlorine	mg/L		0.5-1.5	0.35
Lead (Pb)	mg/L	0.01	≤0.05	0.006
Fluoride	mg/L	1.5	≤1.5	0.26
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.24
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.
Copper (Cu)	mg/L	2	2	0.012
Zinc (Zn)	mg/L	3	5	0.28
Boron (B)	mg/L	0.3	0.3	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health Organisation

Signature of Analyst



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Environmental Protection Agency (EPA-KPK) Certified

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 Project Dir 348 (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar



Integrated Environment Laboratory

AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT



Reference Number	KPRRD/ENV/77-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	15-12-2023	Monitoring Instrument:	AQMS65, Serial # 1310
Source:	Ambient Air		
Road/Bridges IDS	T-42, T-43, RRD-DR-R1, RRD-DRU-NR3, RRD-DRU-NR4, DRU-BR-26, DRU-BR-53		

Sr. No.	Road IDs	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		Units			
		(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)
1	T-42	34.17	0.23	3.36	2.4
2	T-43	32.3	0.18	3.13	2.36
3	RRD-DRU-R1	25.45	0.09	2.21	1.63
4	RRD-DRUNR3	28.33	0.13	2.54	1.98
5	RRD-DRU-NR4	30.79	0.22	2.99	2.15
6	DRU-BR-26	33.36	0.26	4.02	2.51
7	DRU-BR-53	35.12	0.3	4.25	2.72
	NEQSAA	150 (24 hr)	05 (24 hr)	80 (24 hr)	120 (24 hr)
	WHO	45 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health organization

Note:

- Selected measurement units were µg/m³ or mg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

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Signature of Analyst



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C&W Department Peshawar



NOISE LEVEL MONITORING REPORT

Reference Number	KPRRDP/ENV/77-2023		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Reporting Date:	15-12-2023	Monitoring Instrument:	Noise Meter-IEC651-Type-2
Source:	Ambient Noise		
Road/Bridges IDS	T-42, T-43,RRD-DR-R1, RRD-DRU-NR3, RRD-DRU-NR4, DRU-BR-26, DRU-BR-53		

Sr. No.	Road IDs	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	T-42	dB(A)	39.91	26.99
2	T-43		36.5	25.13
3	RRD-DRU-R1		43.99	30.56
4	RRD-DRUNR3		34.12	22.27
5	RRD-DRU-NR4		35.46	26.73
6	DRU-BR-26		42.4	33.65
7	DRU-BR-53		40.62	31.8
NEQS Noise Standards			55	45
WHO Permissible Noise			70	

NEQS: National Environmental Quality Standards
 WHO: World Health organization
 Leq: Log Equivalent Continuous Sound Level
 Note:

- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/77-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	15-12-2023	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				T-42	T-43
pH	--	6.5-8.5	6.5-8.5	7.08	7.04
Temperature	°C	—	—	10	9
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	2	1
Turbidity	NTU	<5	<5	1.6	1.9
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	306	320
Total Hardness as CaCO ₃	mg/L	—	<500	302	289
Nitrate (NO ₃)	mg/L	50	≤50	0.41	0.67
Nitrite (NO ₂)	mg/L	3	≤3	0.006	0.018
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	158	165
Chlorine	mg/L	—	0.5-1.5	0.54	0.58
Lead (Pb)	mg/L	0.01	≤0.05	0.001	0.003
Fluoride	mg/L	1.5	≤1.5	0.09	0.13
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.13	0.14
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.012	0.019
Zinc (Zn)	mg/L	3	5	0.46	0.52
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

Signature of Analyst:



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WATER ANALYSIS REPORT

Reference Number:	KPRRD/ENV/77-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	15-12-2023		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				RRD-DRU-R1	RRD-DRU-NR3
pH	--	6.5-8.5	6.5-8.5	7.11	7.05
Temperature	°C	---	---	8	9
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	2	1
Turbidity	NTU	<5	<5	1.2	2.3
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	344	353
Total Hardness as CaCO ₃	mg/L	---	<500	349	360
Nitrate (NO ₃)	mg/L	50	≤50	1.15	1.23
Nitrite (NO ₂)	mg/L	3	≤3	0.005	0.019
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	143	140
Chlorine	mg/L		0.5-1.5	0.43	0.51
Lead (Pb)	mg/L	0.01	≤0.05	0.0005	0.004
Fluoride	mg/L	1.5	≤1.5	0.05	0.29
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.15	0.17
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.018	0.021
Zinc (Zn)	mg/L	3	5	0.15	0.57
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D.: Not Detected


WHO: World Health organization

Signature of Analyst 


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 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/77-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	15-12-2023		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				RRD-DRU-NR4	DRU-BR-26
pH	—	6.5-8.5	6.5-8.5	7.13	7.08
Temperature	°C	—	—	9	8
Taste & Odor	—	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	0	1
Turbidity	NTU	<5	<5	-0.1	0.4
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	299	333
Total Hardness as CaCO ₃	mg/L	—	<500	351	334
Nitrate (NO ₃)	mg/L	50	≤50	0.14	0.21
Nitrite (NO ₂)	mg/L	3	≤3	0.24	0.38
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	151	164
Chlorine	mg/L	—	0.5-1.5	0.36	0.54
Lead (Pb)	mg/L	0.01	≤0.05	0.0016	0.029
Fluoride	mg/L	1.5	≤1.5	0.047	0.03
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.29	0.33
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.16	0.13
Zinc (Zn)	mg/L	3	5	0.21	1.03
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0
Total Coliform	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0


NDWQS: National Drinking Water Quality Standards
 N.D.: Not Detected
 WHO: World Health organization

Signature of Analyst 


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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/77-2023		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	15-12-2023	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results
				DRU-BR-53
pH	—	6.5-8.5	6.5-8.5	7.21
Temperature	°C	—	—	9
Taste & Odor	—	Non- Objectionable	Non-Objectionable	Non Objectionable
Color	TCU	≤ 15	<15	1
Turbidity	NTU	<5	<5	0.9
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	342
Total Hardness as CaCO ₃	mg/L	—	<500	307
Nitrate (NO ₃)	mg/L	50	≤50	0.02
Nitrite (NO ₂)	mg/L	3	≤3	0.1
Arsenic (As)	mg/L	0.01	≤0.05	N.D
Nickel (Ni)	mg/L	0.02	≤0.02	N.D
Antimony (Sb)	mg/L	0.005	<0.005	N.D
Chloride (Cl)	mg/L	250	<250	145
Chlorine	mg/L	—	0.5-1.5	0.53
Lead (Pb)	mg/L	0.01	≤0.05	0.002
Fluoride	mg/L	1.5	≤1.5	0.41
Aluminum	mg/L	≤ 0.2	≤0.2	N.D
Manganese (Mn)	mg/L	0.5	≤0.5	N.D
Cadmium (Cd)	mg/L	0.003	0.01	N.D
Barium (Ba)	mg/L	0.3	0.7	0.26
Mercury (Hg)	mg/L	0.001	≤0.001	N.D
Copper (Cu)	mg/L	2	2	0.003
Zinc (Zn)	mg/L	3	5	0.63
Boron (B)	mg/L	0.3	0.3	N.D
Chromium (Cr)	mg/L	0.05	≤0.05	N.D
Selenium (Se)	mg/L	0.01	0.01	N.D
Cyanide (CN)	mg/L	0.07	≤0.05	N.D
E-Coli	Number/100 ml.	Must not be detectable in any 100 ml sample	0 Number/100 ml.	0
Total Coliform	Number/100 ml.	Must not be detectable in any 100 ml sample	0 Number/100 ml.	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected


WHO: World Health Organization

Signature of Analyst: 


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Integrated Environment Laboratory

AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT



EPA Accredited

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	13-04-2024	Monitoring Instrument:	AQMS65, Serial # 1310
Source:	Ambient Air		
Road/Bridge IDS	SWT-6, T-19, T-4, N-SWT-T2, N-SWT-T4, NSWT-T3, SWT-BR-8, SWT-BR-30, SWT-BR-106		

Sr. No.	Road/Bridge IDS	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)
1	SWT-6	30.49	0.19	2.09	1.98
2	T-19	34.12	0.21	2.51	2.29
3	T-4	32.25	0.16	2.63	2.14
4	N-SWT-T2	32.35	0.31	4.21	4.63
5	N-SWT-T4	35.98	0.33	4.7	4.98
6	N-SWT-T3	34.54	0.26	3.49	4.14
7	SWT-BR-8	37.11	0.3	4.52	4.5
8	SWT-BR-30	38.87	0.34	4.75	4.71
9	SWT-BR-106	35.23	0.27	5.85	5.63
NEQSAA		150 (24 hr)	05 (24 hr)	80 (24 hr)	120 (24 hr)
WHO		45 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health organization

Note:

- Selected measurement units were µg/m³ or mg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

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NOISE LEVEL MONITORING REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Reporting Date:	13-04-2024	Monitoring Instrument:	Noise Meter-IEC651-Type-2
Source:	Ambient Noise		
Road/Bridge IDS	SWT-6, T-19, T-4, N-SWT-T2, N-SWT-T4, NSWT-T3, SWT-BR-8, SWT-BR-30, SWT-BR-106		

Sr. No.	Road/Bridge IDS	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	SWT-6	dB(A)	45.82	36.4
2	T-19		43.87	30.54
3	T-4		40.46	28.68
4	N-SWT-T2		47.95	34.11
5	N-SWT-T4		38.08	25.82
6	N-SWT-T3		39.42	30.26
7	SWT-BR-8		46.36	37.2
8	SWT-BR-30		44.78	35.35
9	SWT-BR-106		44.8	35.79
NEQS Noise Standards			55	45
WHO Permissible Noise			70	

NEQS: National Environmental Quality Standards
 WHO: World Health organization
 Leq: Log Equivalent Continuous Sound Level

- Note:**
- Selected measurement units were dB (A) otherwise stated.
 - Quality was assured through self calibration of the instrument.
 - The values were representing of monitoring conditions prevailing during the monitoring hours.
 - The measurements were carried out on client request.
 - The client is responsible lawful usage of reported data in future.
 - The report is not valid for court.

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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	13-04-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				SWT-6	T-19
pH	--	6.5-8.5	6.5-8.5	7.37	7.17
Temperature	°C	---	---	11	13
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	3	5
Turbidity	NTU	<5	<5	1.9	3.2
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	328	339
Total Hardness as CaCO ₃	mg/L	---	<500	318	331
Nitrate (NO ₃)	mg/L	50	≤50	0.29	0.57
Nitrite (NO ₂)	mg/L	3	≤3	0.07	0.006
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	114.5	127
Chlorine	mg/L	---	0.5-1.5	0.52	0.51
Lead (Pb)	mg/L	0.01	≤0.05	0.007	0.001
Fluoride	mg/L	1.5	≤1.5	0.7	0.46
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.26	0.18
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.041	0.061
Zinc (Zn)	mg/L	3	5	0.56	0.81
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D.: Not Detected

WHO: World Health Organization

Signature of Analyst



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Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	13-04-2024		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				T-4	N-SWT-T2
pH	—	6.5-8.5	6.5-8.5	7.38	7.07
Temperature	°C	---	---	13	12
Taste & Odor	—	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	3	4
Turbidity	NTU	<5	<5	2.9	3
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	362	341
Total Hardness as CaCO ₃	mg/L	---	<500	325	312
Nitrate (NO ₃)	mg/L	50	≤50	0.39	0.41
Nitrite (NO ₂)	mg/L	3	≤3	0.03	0.004
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	120	113
Chlorine	mg/L		0.5-1.5	0.42	0.68
Lead (Pb)	mg/L	0.01	≤0.05	0.008	0.002
Fluoride	mg/L	1.5	≤1.5	0.35	0.44
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.3	0.16
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.191	0.031
Zinc (Zn)	mg/L	3	5	0.92	0.79
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

Signature of Analyst



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Environmental Protection Agency (EPA-KPK) Certified

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Project Dir 358 (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	13-04-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				N-SWT-T4	NSWT-T3
pH	--	6.5-8.5	6.5-8.5	7.27	7.07
Temperature	°C	---	---	12	13
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	3	4
Turbidity	NTU	<5	<5	3.2	3
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	365	376
Total Hardness as CaCO ₃	mg/L	---	<500	314	325
Nitrate (NO ₃)	mg/L	50	≤50	0.25	0.41
Nitrite (NO ₂)	mg/L	3	≤3	0.05	0.06
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	119	126
Chlorine	mg/L		0.5-1.5	0.62	0.27
Lead (Pb)	mg/L	0.01	≤0.05	0.004	0.005
Fluoride	mg/L	1.5	≤1.5	0.37	0.53
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.27	0.22
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.221	0.061
Zinc (Zn)	mg/L	3	5	0.8	0.8
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards
 N.D: Not Detected
 WHO: World Health organization

Signature of Analyst: 


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 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	13-04-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				SWT-BR-8	SWT-BR-30
pH	--	6.5-8.5	6.5-8.5	6.87	7.19
Temperature	°C	---	---	13	12
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	4	3
Turbidity	NTU	<5	<5	1.1	2
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	330	348
Total Hardness as CaCO ₃	mg/L	---	<500	319	330
Nitrate (NO ₃)	mg/L	50	≤50	0.49	0.38
Nitrite (NO ₂)	mg/L	3	≤3	0.05	0.11
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	135	131
Chlorine	mg/L	---	0.5-1.5	0.23	0.19
Lead (Pb)	mg/L	0.01	≤0.05	0.001	0.003
Fluoride	mg/L	1.5	≤1.5	0.69	0.45
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.24	0.28
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.041	0.012
Zinc (Zn)	mg/L	3	5	0.76	0.93
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

Signature of Analyst



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 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/09-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	13-04-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results
				SWT-BR-106
pH	--	6.5-8.5	6.5-8.5	7.14
Temperature	°C	---	---	13
Taste & Odor	--	Non- Objectionable	Non-Objectionable	Non Objectionable
Color	TCU	≤ 15	<15	3
Turbidity	NTU	<5	<5	2.9
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	358
Total Hardness as CaCO ₃	mg/L	---	<500	316
Nitrate (NO ₃)	mg/L	50	≤50	0.25
Nitrite (NO ₂)	mg/L	3	≤3	0.07
Arsenic (As)	mg/L	0.01	≤0.05	N.D
Nickel (Ni)	mg/L	0.02	≤0.02	N.D
Antimony (Sb)	mg/L	0.005	<0.005	N.D
Chloride (Cl)	mg/L	250	<250	120
Chlorine	mg/L	---	0.5-1.5	0.26
Lead (Pb)	mg/L	0.01	≤0.05	0.007
Fluoride	mg/L	1.5	≤1.5	0.42
Aluminum	mg/L	≤ 0.2	≤0.2	N.D
Manganese (Mn)	mg/L	0.5	≤0.5	N.D
Cadmium (Cd)	mg/L	0.003	0.01	N.D
Barium (Ba)	mg/L	0.3	0.7	0.26
Mercury (Hg)	mg/L	0.001	≤0.001	N.D
Copper (Cu)	mg/L	2	2	0.021
Zinc (Zn)	mg/L	3	5	0.56
Boron (B)	mg/L	0.3	0.3	N.D
Chromium (Cr)	mg/L	0.05	≤0.05	N.D
Selenium (Se)	mg/L	0.01	0.01	N.D
Cyanide (CN)	mg/L	0.07	≤0.05	N.D
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

Signature of Analyst 


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AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT



Reference Number	KPRRD/ENV/01-2024		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Reporting Date:	03-02-2024	Monitoring Instrument:	AQMS65, Serial # 1310
Source:	Ambient Air		
Road/Bridge IDS	T-2, SWB-BR-55		

Sr. No.	Road/Bridge IDs	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		Units			
		($\mu\text{g}/\text{m}^3$)	(mg/m^3)	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)
1	T-2	39.68	0.16	2.42	2.31
2	SWB-BR-55	41.04	0.18	2.59	2.40
	NEQSAA	150 (24 hr)	05 (24 hr)	80 (24 hr)	120 (24 hr)
	WHO	45 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health organization

Note:

- Selected measurement units were $\mu\text{g}/\text{m}^3$ or mg/m^3 otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.


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NOISE LEVEL MONITORING REPORT

Reference Number	KPRRD/ENV/01-2024		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Reporting Date:	03-02-2024	Monitoring Instrument:	Noise Meter-IEC851-Type-2
Source:	Ambient Noise		
Road/ Bridge IDs:	T-2, SWB-BR-55		

Sr. No.	Road/Bridge IDs	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	T-2	dB(A)	43.6	37.24
2	SWB-BR-55		45.97	39.59
NEQS Noise Standards			55	45
WHO Permissible Noise			70	

NEQS: National Environmental Quality Standards
 WHO: World Health organization
 Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/01-2024		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Reporting Date:	03-02-2024		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				T-2	SWB-BR-55
pH	--	6.5-8.5	6.5-8.5	7.5	7.58
Temperature	°C	---	---	14	14
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	4	4
Turbidity	NTU	<5	<5	4.5	2.1
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	354	300
Total Hardness as CaCO ₃	mg/L	---	<500	263	254
Nitrate (NO ₃)	mg/L	50	≤50	2.86	1.77
Nitrite (NO ₂)	mg/L	3	≤3	0.009	0.23
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	110	121
Chlorine	mg/L		0.5-1.5	0.51	0.38
Lead (Pb)	mg/L	0.01	≤0.05	0.004	0.003
Fluoride	mg/L	1.5	≤1.5	0.31	0.27
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.18	0.24
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.13	0.1
Zinc (Zn)	mg/L	3	5	0.77	0.9
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0
Total Coliform	Number/100 ml	Must not be detectable in any 100 ml sample	0 Number/100 ml	0	0

NDWQS: National Drinking Water Quality Standards

N.D.: Not Detected

WHO: World Health organization

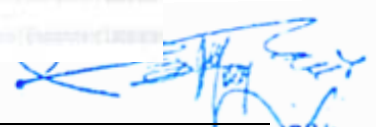
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AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT



Reference Number	KPRRD/ENV/15-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	16-03-2024	Monitoring Instrument:	AQMS65, Serial # 1310
Source:	Ambient Air		
Road/ Bridge IDS	MAN-2, T-12, T-2, MAN-BR-11, MAN-BR-100		

Sr. No.	Road/Bridge IDs	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		Units			
		(µg/m ³)	(mg/m ³)	(µg/m ³)	(µg/m ³)
1	MAN-2	38.92	0.22	2.69	2.07
2	T-12	42.55	0.24	3.11	2.36
3	T-22	40.68	0.19	3.23	2.23
4	MAN-BR-11	40.78	0.34	4.81	4.72
5	MAN-BR-100	44.41	0.36	5.3	5.07
	NEQSAA	150 (24 hr)	06 (24 hr)	80 (24 hr)	120 (24 hr)
	WHO	45 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air
 WHO: World Health organization

Note:

- Selected measurement units were µg/m³ or mg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst

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Project Director (PIU)
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NOISE LEVEL MONITORING REPORT

Reference Number	KPRRD/ENV/15-2024		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Reporting Date:	16-03-2024	Monitoring Instrument:	Noise Meter-IEC651-Type-2
Source:	Ambient Noise		
Road/Bridge IDs	MAN-2, T-12, T-2, MAN-BR-11, MAN-BR-100		

Sr. No.	Road/Bridge IDs	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	MAN-2	dB(A)	47.68	38.26
2	T-12		45.73	32.4
3	T-22		42.32	30.54
4	MAN-BR-11		49.81	35.97
5	MAN-BR-100		39.94	27.68
NEQS Noise Standards			55	45
WHO Permissible Noise			70	

NEQS: National Environmental Quality Standards
 WHO: World Health organization
 Leq: Log Equivalent Continuous Sound Level
 Note:

- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/15-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	16-03-2024		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				MAN-2	T-12
pH	--	6.5-8.5	6.5-8.5	7.4	7.2
Temperature	°C	---	---	13	13
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	7	8
Turbidity	NTU	<5	<5	4.6	4.4
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	420	411
Total Hardness as CaCO ₃	mg/L	-----	<500	290	284
Nitrate (NO ₃)	mg/L	50	≤50	1.33	1.21
Nitrite (NO ₂)	mg/L	3	≤3	0.07	0.08
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	85	92
Chlorine	mg/L		0.5-1.5	0.55	0.2
Lead (Pb)	mg/L	0.01	≤0.05	0.006	0.007
Fluoride	mg/L	1.5	≤1.5	0.57	0.59
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.42	0.37
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.25	0.09
Zinc (Zn)	mg/L	3	5	1.12	1.12
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0


NDWQS: National Drinking Water Quality Standards
 N.D.: Not Detected
 WHO: World Health organization

Signature of Analyst: 


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Project Director (PIU)
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 C&W Department Peshawar



WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/15-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	16-03-2024	Sampling Done by:	Analyst
Source:	Drinking Water	Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				T-22	MAN-BR-11
pH	—	6.5-8.5	6.5-8.5	7	7.32
Temperature	°C	—	—	14	13
Taste & Odor	—	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	7	7
Turbidity	NTU	<5	<5	2.5	3.4
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	341	359
Total Hardness as CaCO ₃	mg/L	—	<500	297	302
Nitrate (NO ₃)	mg/L	50	≤50	1.17	1.2
Nitrite (NO ₂)	mg/L	3	≤3	0.07	0.13
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	101	97
Chlorine	mg/L	—	0.5-1.5	0.16	0.12
Lead (Pb)	mg/L	0.01	≤0.05	0.003	0.005
Fluoride	mg/L	1.5	≤1.5	0.89	0.61
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.26	0.43
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.07	0.041
Zinc (Zn)	mg/L	3	5	1.08	1.25
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards
 N.D.: Not Detected
 WHO: World Health Organization

Signature of Analyst:



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 C&W Department Peshawar



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WATER ANALYSIS REPORT



Reference Number	KPRRD/ENV/15-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	16-03-2024		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results
				MAN-BR-100
pH	--	6.5-8.5	6.5-8.5	7.27
Temperature	°C	---	---	16
Taste & Odor	--	Non- Objectionable	Non-Objectionable	Non Objectionable
Color	TCU	≤ 15	<15	5
Turbidity	NTU	<5	<5	4.1
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	369
Total Hardness as CaCO ₃	mg/L	---	<500	311
Nitrate (NO ₃)	mg/L	50	≤50	1.35
Nitrite (NO ₂)	mg/L	3	≤3	0.09
Arsenic (As)	mg/L	0.01	≤0.05	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.
Chloride (Cl)	mg/L	250	<250	86
Chlorine	mg/L		0.5-1.5	0.19
Lead (Pb)	mg/L	0.01	≤0.05	0.009
Fluoride	mg/L	1.5	≤1.5	0.58
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.41
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.
Copper (Cu)	mg/L	2	2	0.03
Zinc (Zn)	mg/L	3	5	0.88
Boron (B)	mg/L	0.3	0.3	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

Signature of Analyst:



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AMBIENT PARTICULATE MATTER AND GASEOUS MONITORING REPORT

Reference Number	KPRRD/ENV/18-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	04-04-2024	Monitoring Instrument:	AQMS65, Serial # 1310
Source:	Ambient Air		
Road IDS	CHR-4, MLK-7, MLK-4, N-MLK-1, N-MLK-2		

Sr. No.	Road IDs	24 Hours Average Concentration of Pollutants			
		PM ₁₀	CO	NO ₂	SO ₂
		Units			
		($\mu\text{g}/\text{m}^3$)	(mg/m^3)	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)
1	CHR-4	32.83	0.17	5.31	5.3
2	MLK-7	35.71	0.21	5.64	5.65
3	MLK-4	38.17	0.3	6.09	5.82
4	N-MLK-1	40.74	0.34	7.12	6.18
5	N-MLK-2	42.5	0.38	7.35	6.39
	NEQSAA	150 (24 hr)	05 (24 hr)	80 (24 hr)	120 (24 hr)
	WHO	45 (24 hr)	04 (24 hr)	25 (24 hrs)	40 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air
 WHO: World Health organization

Note:

- Selected measurement units were $\mu\text{g}/\text{m}^3$ or mg/m^3 otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst: 


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NOISE LEVEL MONITORING REPORT

Reference Number	KPRRD/ENV/18-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	04-04-2024	Monitoring Instrument:	Noise Meter-IEC851-Type-2
Source:	Ambient Noise		
Road IDs:	CHR-4, MLK-7, MLK-4, N-MLK-1, N-MLK-2		

Sr. No.	Road IDs	Units	Day Time Average (Leq) (06:00 AM to 10:00 PM)	Night Time Average (Leq) (10:00 PM to 06:00 AM)
1	CHR-4	dB(A)	49.87	36.44
2	MLK-7		40	28.15
3	MLK-4		41.34	32.61
4	N-MLK-1		48.28	39.53
5	N-MLK-2		46.7	37.68
NEQS Noise Standards			55	45
WHO Permissible Noise			70	

NEQS: National Environmental Quality Standards
 WHO: World Health organization
 Leq: Log Equivalent Continuous Sound Level

- Note:
- Selected measurement units were dB (A) otherwise stated.
 - Quality was assured through self calibration of the instrument.
 - The values were representing of monitoring conditions prevailing during the monitoring hours.
 - The measurements were carried out on client request.
 - The client is responsible lawful usage of reported data in future.
 - The report is not valid for court.

Signature of Analyst

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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/18-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	04-04-2024		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				CHR-4	MLK-7
pH	--	6.5-8.5	6.5-8.5	7.2	7.16
Temperature	°C	---	---	13	12
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non-Objectionable
Color	TCU	≤ 15	<15	5	4
Turbidity	NTU	<5	<5	2.8	3.1
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	317	331
Total Hardness as CaCO ₃	mg/L	---	<500	278	289
Nitrate (NO ₃)	mg/L	50	≤50	0.84	1.1
Nitrite (NO ₂)	mg/L	3	≤3	0.016	0.028
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	124	131
Chlorine	mg/L	---	0.5-1.5	0.52	0.56
Lead (Pb)	mg/L	0.01	≤0.05	0.002	0.004
Fluoride	mg/L	1.5	≤1.5	0.25	0.29
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.15	0.14
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.021	0.028
Zinc (Zn)	mg/L	3	5	0.76	0.82
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization


Signature of Analyst: 


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WATER ANALYSIS REPORT

Reference Number	KPRRD/ENV/18-2024		
Project Name:	Khyber Pakhtunkhawa Rural Roads Development Project		
Reporting Date:	04-04-2024		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results	
				MLK-4	N-MLK-1
pH	--	6.5-8.5	6.5-8.5	7.23	7.17
Temperature	°C	---	---	11	12
Taste & Odor	--	Non-Objectionable	Non-Objectionable	Non Objectionable	Non Objectionable
Color	TCU	≤ 15	<15	5	4
Turbidity	NTU	<5	<5	2.4	3.5
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	355	364
Total Hardness as CaCO ₃	mg/L	---	<500	325	336
Nitrate (NO ₃)	mg/L	50	≤50	1.58	1.66
Nitrite (NO ₂)	mg/L	3	≤3	0.015	0.029
Arsenic (As)	mg/L	0.01	≤0.05	N.D.	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.	N.D.
Chloride (Cl)	mg/L	250	<250	109	106
Chlorine	mg/L		0.5-1.5	0.59	0.53
Lead (Pb)	mg/L	0.01	≤0.05	0.0015	0.005
Fluoride	mg/L	1.5	≤1.5	0.21	0.45
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.17	0.19
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.	N.D.
Copper (Cu)	mg/L	2	2	0.027	0.03
Zinc (Zn)	mg/L	3	5	0.45	0.87
Boron (B)	mg/L	0.3	0.3	N.D.	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

Signature of Analyst



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C&W Department Peshawar



WATER ANALYSIS REPORT



Reference Number	KPRRD/ENV/18-2024		
Project Name:	Khyber Pakhtunkhwa Rural Roads Development Project		
Reporting Date:	04-04-2024		
Source:	Drinking Water	Sampling Done by:	Analyst
		Analysis Method:	APHA/USEPA Standard Methods

Parameters	Units	WHO	NDWQS	Results
				N-MLK-2
pH	--	6.5-8.5	6.5-8.5	7.25
Temperature	°C	---	---	12
Taste & Odor	--	Non- Objectionable	Non- Objectionable	Non Objectionable
Color	TCU	≤ 15	<15	3
Turbidity	NTU	<5	<5	1.1
Total Dissolved Solids (TDS)	mg/L	< 1000	<1000	310
Total Hardness as CaCO ₃	mg/L	-----	<500	327
Nitrate (NO ₃)	mg/L	50	≤50	0.57
Nitrite (NO ₂)	mg/L	3	≤3	0.25
Arsenic (As)	mg/L	0.01	≤0.05	N.D.
Nickel (Ni)	mg/L	0.02	≤0.02	N.D.
Antimony (Sb)	mg/L	0.005	<0.005	N.D.
Chloride (Cl)	mg/L	250	<250	117
Chlorine	mg/L		0.5-1.5	0.58
Lead (Pb)	mg/L	0.01	≤0.05	N.D.
Fluoride	mg/L	1.5	≤1.5	0.08
Aluminum	mg/L	≤ 0.2	≤0.2	N.D.
Manganese (Mn)	mg/L	0.5	≤0.5	N.D.
Cadmium (Cd)	mg/L	0.003	0.01	N.D.
Barium (Ba)	mg/L	0.3	0.7	0.12
Mercury (Hg)	mg/L	0.001	≤0.001	N.D.
Copper (Cu)	mg/L	2	2	0.17
Zinc (Zn)	mg/L	3	5	0.51
Boron (B)	mg/L	0.3	0.3	N.D.
Chromium (Cr)	mg/L	0.05	≤0.05	N.D.
Selenium (Se)	mg/L	0.01	0.01	N.D.
Cyanide (CN)	mg/L	0.07	≤0.05	N.D.
E-Coli	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
Total Coliform	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS: National Drinking Water Quality Standards

N.D: Not Detected

WHO: World Health organization

Signature of Analyst:




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 C&W Department Peshawar

Annexure 3 - IBAT Proximity Anlayis



Integrated Biodiversity Assessment Tool FRESHWATER REPORT DRL-BR-61_SHALAPALM BRIDGE

Country: Pakistan
Location: [34.9, 72]
Date of analysis: 02 May 2024 (GMT)
Upstream: 0 km | 10 km | 15 km
Downstream: 5 km | 10 km | 15 km
Generated by: Nick Kitchner
Organisation: A.I.B

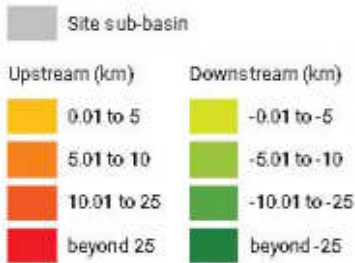


DRL-BR-61_Shalapalm Bridge | Page 1 of 27


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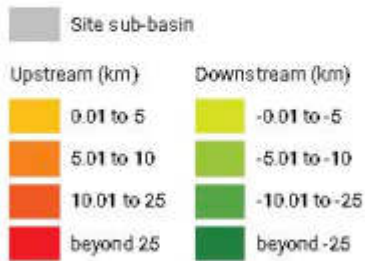
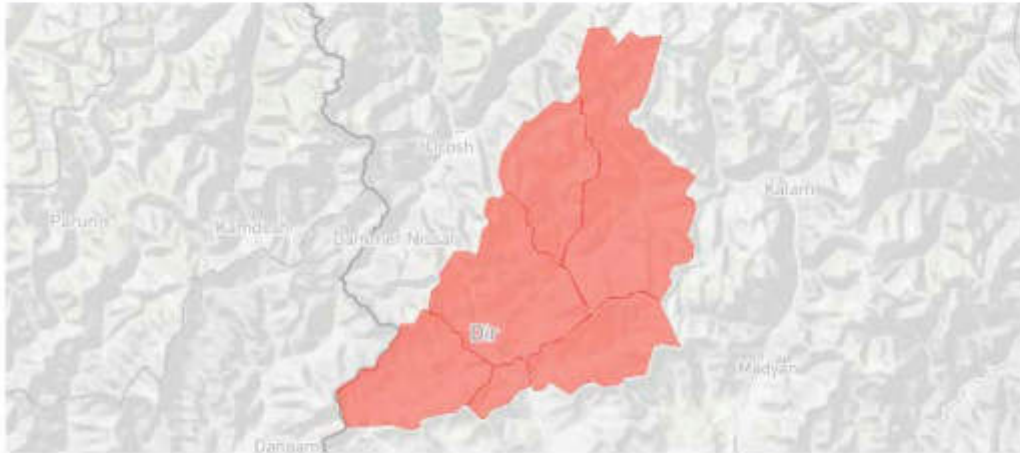
Site sub-basin



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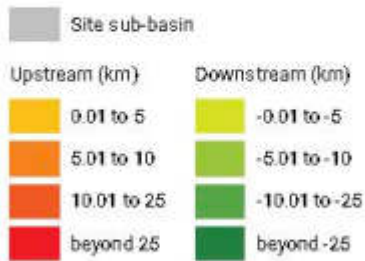
Upstream beyond 25



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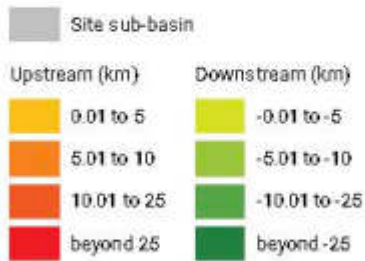
Downstream beyond -25




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Downstream -10.01 to -25




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Provincial Road Improvement Project
C&W Department Peshawar

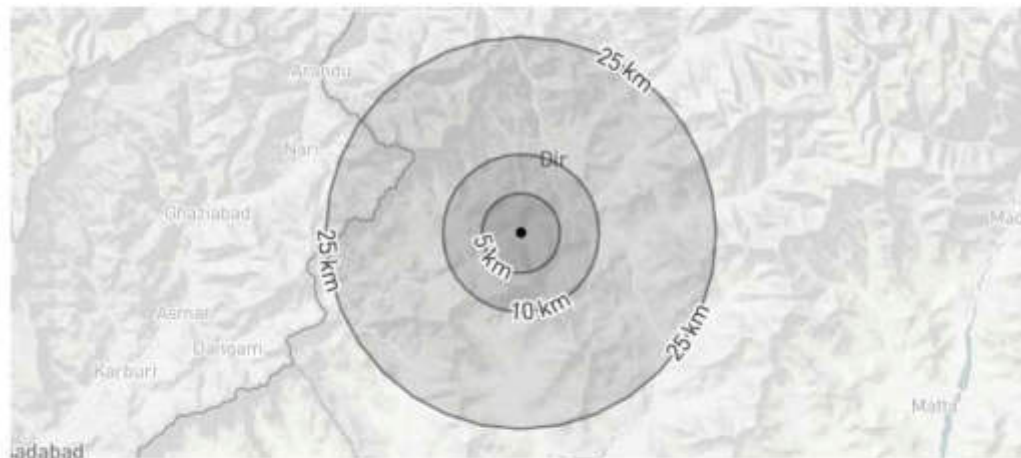


Integrated Biodiversity Assessment Tool
PROXIMITY REPORT
DRU-BR-26_NANGARI BRIDGE

Country: Pakistan
 Location: [35.1, 71.8]
 Date of analysis: 05 May 2024 (GMT)
 Buffers applied: 5 km | 10 km | 25 km
 IUCN Red List Biomes: Freshwater, Terrestrial
 Generated by: Nick Skinner
 Organisation: ADB

Overlaps with:

Protected Areas	2
Key Biodiversity Areas	0
IUCN Red List	31



Displaying project location and buffers: 5 km, 10 km, 25 km



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 C&W Department Peshawar



Protected Areas

The following protected areas are found within 5 km, 10 km, 25 km of the area of interest. For further details please refer to the associated csv file in the report folder.

Area name	Within buffer of
Darosh Gol	25 km
Hant Gol (Hant Gol)	25 km

Key Biodiversity Areas

The following key biodiversity areas are found within 5 km, 10 km, 25 km of the area of interest. For further details please refer to the associated csv files in the report folder.

No KBA within buffer distance.

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Vanelus gregarius	Sociable Lapwing	AVES	CR	Decreasing	Terrestrial
Gyps bengalensis	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
Sarcogyps calvus	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
Schistura afasciata		ACTINOPTERYGII	EN	Decreasing	Freshwater



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Integrated Biodiversity Assessment Tool

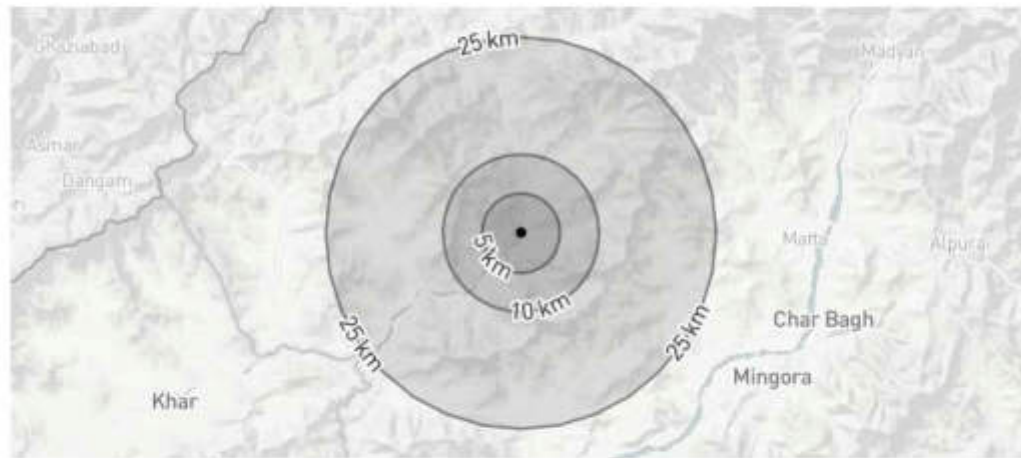
PROXIMITY REPORT

DRU-BR-53_MALAK ABAD BRIDGE

Country: Pakistan
Location: [34.9, 72]
Date of analysis: 05 May 2024 (GMT)
Buffers applied: 5 km | 10 km | 25 km
IUCN Red List Biomes: Freshwater, Terrestrial
Generated by: Nick Skinner
Organisation: ADB


Overlaps with:

Protected Areas	1
Key Biodiversity Areas	0
IUCN Red List	40



Displaying project location and buffers: 5 km, 10 km, 25 km




Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar



Integrated Biodiversity Assessment Tool PROXIMITY REPORT GANSHAL BRIDGE

Country: Pakistan

Location: [35.1, 72.7]

Date of analysis: 05 May 2024 (GMT)

Buffers applied: 5 km | 10 km | 25 km

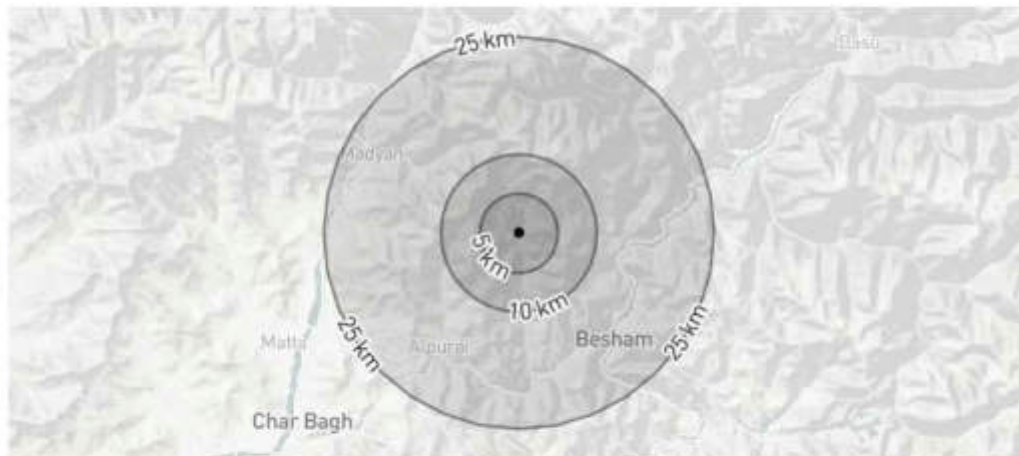
IUCN Red List Biomes: Freshwater, Terrestrial

Generated by: Nick Skinner

Organisation: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	3
IUCN Red List	34



Displaying project location and buffers: 5 km, 10 km, 25 km




Project Director (PIU)
 Provincial Road Improvement Project
 C&W Department Peshawar

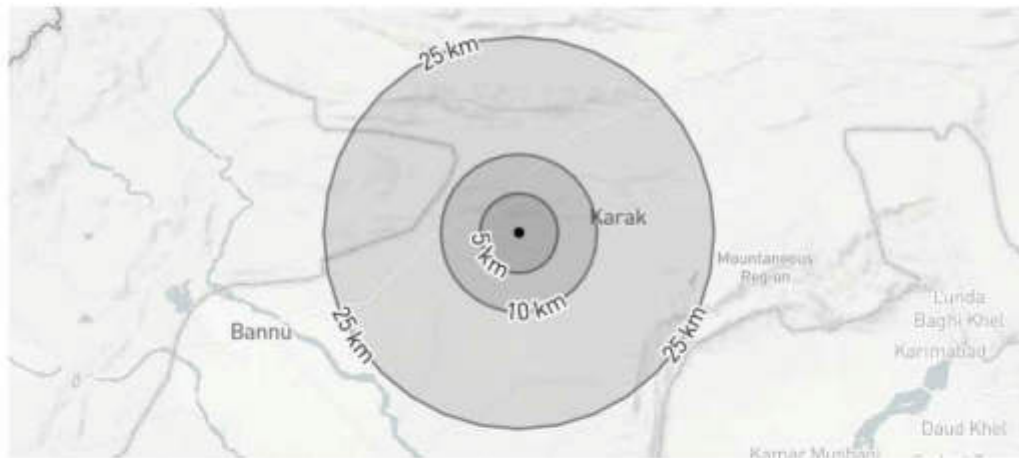


Integrated Biodiversity Assessment Tool
PROXIMITY REPORT
KR-BR-112_LATAMBAR BRIDGE KASHO

Country: Pakistan
 Location: [33.1, 71]
 Date of analysis: 05 May 2024 (GMT)
 Buffers applied: 5 km | 10 km | 25 km
 IUCN Red List Biomes: Freshwater, Terrestrial
 Generated by: Nick Skinner
 Organisation: ADB

Overlaps with:

Protected Areas	1
Key Biodiversity Areas	0
IUCN Red List	39



Displaying project location and buffers: 5 km, 10 km, 25 km



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Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

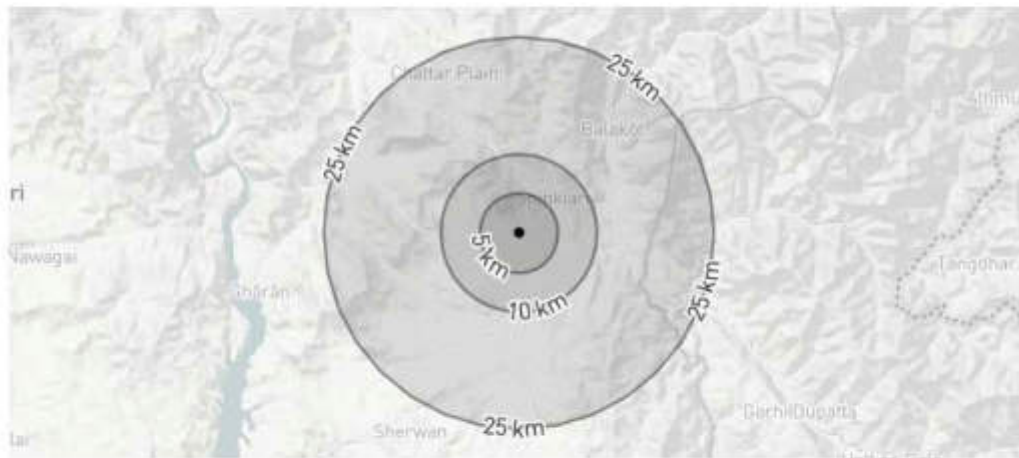


Integrated Biodiversity Assessment Tool
PROXIMITY REPORT
MAN-BR-11_SIREN BRIDGE

Country: Pakistan
 Location: [34.4, 73.2]
 Date of analysis: 05 May 2024 (GMT)
 Buffers applied: 5 km | 10 km | 25 km
 IUCN Red List Biomes: Freshwater, Terrestrial
 Generated by: Nick Skinner
 Organisation: ADB

Overlaps with:

Protected Areas	2
Key Biodiversity Areas	0
IUCN Red List	42



Displaying project location and buffers: 5 km, 10 km, 25 km



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Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

Annexure 4 - Dust Management Plan

General

The purpose of this plan is to describe the measures that the project shall take to ensure that the risk of emissions from dust generated by site operations during construction are minimized and that best practice measures are implemented.

- Dust emissions from construction can cause ill health effects to Contractor staff along with nuisance and annoyance to members of the local community. Dust will be controlled through:
 - Elimination
 - Reduction/Minimization
 - Control

Methodology

The following methodology will be undertaken for each project section:

Step 1 – Identify the dust generating activities

- Construction activities that are likely to produce dust will be identified. The activities that will be taken into account are:
 - Haulage Routes, Vehicles and Asphalt/Concrete Batching Plant
 - Roads, surfaces and public highways
 - Static and mobile combustion plant emissions
 - Tarmac laying, bitumen surfacing and coating
 - Materials Handling, Storage, Spillage and Disposal
 - Storage of material
 - Stockpiles
 - Spillages
 - Storage of Waste
 - Site Preparation and Restoration after Completion
 - Earthworks, excavation and digging
 - Storage of spoil and topsoil
 - Demolition
 - Construction and Fabrication Processes
 -

Step 2 – Identify Sensitive Receptors

- Sensitive receptors have already been identified. The nature and location of the sensitive receptors will be taken into account when implementing control measures.

Step 3 – Implement Best Practice Measures to Control

- Based on the nature of the activity producing the dust, the likelihood of dust being produced and the possible consequence of dust based on the sensitive receptors, the most effective control measure will be identified and implemented.

Step 4 – Monitor effectiveness of control

CSC will have the responsibility to ensure that dust control measures are being implemented and are effective.

Step 5 – Record and report result of monitoring

All inspections, audits and results of monitoring will be recorded and kept as part of the site filing system.

Optimum site layout:

- Dust generating activities to be conducted away from sensitive receptors
- Supply of water for damping down.
- Good housekeeping and management
- All employees will be briefed on the Risk Assessment and Method Statement before starting work.

Training

A site-specific induction will also be required before being allowed to work on site. These will include site-specific sensitive receptors and details regarding dust control measures to be taken.

Toolbox talks on air pollution and minimizing dust emissions will be provided on a regular basis to Contractor staff.

Identification of Dust Generating Sources and Control Methods

Haulage Routes, Vehicles and Asphalt/Concrete Batching Plant	
Dust Source	Dust Control Methods
Major haul roads and traffic routes	Haul roads will be dampened down via a mobile bowser, as required.
Public Roads	Road sweeper will be used to clean public roads as required.
Site traffic management	Site traffic will be restricted to constructed access roads as far as possible. Site speed limit will be set at 10 mph as this will minimize the production of dust.
Road Cleaning	A mechanical road sweeper will be readily available and used.
Handling, Storage, Stockpiling and Spillage of Dusty materials	
Material handling operations	The number of times a material will have to be handled will be kept to a minimum to prevent double handling and ensure dusty materials are not handled unnecessarily.
Transport of fine dusty materials and aggregates.	Closed tankers will be used or sheeted vehicles.

Vehicle loading/unloading materials on to vehicles and conveyors.	Dusty materials will be dampened down Drop heights will be kept to a minimum and enclosed where possible.
Storage of Materials	
Bulk cement, bentonite etc.	Bentonite will be delivered in tankers and stored in dedicated enclosed areas. Bulk cement will be transported through tractor trollies or trailers.
Fine dry materials	These will be protected from the weather and by storing in appropriate containers and indoors, where necessary.
Storage location	Material will be stored in dedicated lay-down areas.
Storage of Stockpiles	
Stockpile location	Stockpiles will be placed so as to minimize double handling and facilitate the site restoration.
Building stockpiles	Stockpiles, tips and mounds will not be stored at an angle greater than an angle of repose of the material.
Small and temporary stockpiles	Where possible, stockpiles will be placed under sheeting. Dusty material will be damped down. Wind barriers (protective fences) of a similar height to the stockpile will be erected, if required.
Large and long term stockpiles	Long-term stockpiles will be vegetated and stabilized as soon as possible. Stock piles will be dampened down until stabilized, where necessary. Wind barriers (protective fences) of a similar height to the stockpile will be erected, if required.
Waste Material from Construction	
Disposal method	A dedicated lay-down area will be available for waste. Waste will not be allowed to build up and will be disposed of at the designated locations as per EMP.
Site Preparation and Restoration	
Earthworks, excavation and digging	These activity areas will be kept damp where required and if possible, will be avoided during dry and windy periods.
Completed earthworks	Surfaces will be stabilized by re-vegetation as soon as possible, where applicable.
Construction and Fabrication Process	
Crushing of material for reuse, transportation and disposal	Authorization will be obtained from PIU and CSC before using any mobile plant on site for activities such as crushing and screening. Any crushing or screening activities will be located away from sensitive receptors.
Cutting, grinding, drilling, sawing, trimming, planning, sanding	These activities will be avoided wherever possible. Equipment and techniques that minimize dust will be implemented. Water will be used to minimize dust.
Cutting roadways, pavements, blocks	Water sprinkling to be used.

Angle grinders and disk cutters	Best practice measures will be used such as dust extraction.
---------------------------------	--

Monitoring Arrangements

Monitoring will be conducted at sensitive receptor locations in the project area as provided in the SSEMP. Furthermore, at locations where PM levels are exceeding applicable guidelines, additional stringent measures will be implemented at the respective location(s) in the project area to ensure dust levels are controlled as far as possible.



Annexure 5 - Traffic Management Plan

Need for Plan

The construction of roads and bridges will take over 24 months and in this period, huge vehicular movement carrying large amount of material and machinery is expected. This will definitely interrupt the local traffic and is therefore important to manage the traffic to avoid the nuisance to local residents in terms of noise, dust, congestion and inconvenience.

THE PLAN

- The Objective of Traffic Management Plan (TMP) is to define the requirements that should be implemented to mitigate any potential negative risks to the environment, workers or the community resulting from construction traffic.
- The TMP will advise and inform site Contractors and external suppliers of equipment and materials of access and entry points along with other key information such tipping areas and wash-out areas. It is intended to compliment and work alongside relevant SSEMP.
- The TMP will be classed as “live” and therefore be subjected to updates as required.
- Contractor, at the time of the execution of the project will prepare a comprehensive TMP in coordination with local traffic police department, PIU, emergency services and local administrative department. The PIU and CSC will review and approve contractors TMP. The contractor’s TMP shall include following mitigation measures during its preparation:
- Undertake a road conditions assessment prior to and following the peak construction period, to assess any damage to road infrastructure that can be attributed to Project construction.
- Repair damage as appropriate or enter into a voluntary agreement with the relevant roads authority to reimburse the cost of any repairs required to the public road network as a result of the Project.
- Spoil dumpsites located close to Project site to minimize journey distance and limit movements to site access roads.
- Concrete mixing plant located at Project site limiting traffic movements associated with concrete delivery to site access roads.
- Construction of worker accommodation on site to reduce light vehicle movements relating to travel to/ from the site.
- Provision of bus/minibus services for personnel living in nearby settlements
- Movements of construction workers will be planned to avoid the busiest roads and times of day when traffic is at its greatest.
- Schedule deliveries and road movements to avoid peak periods
- Road maintenance fund to leave a useful asset for communities after the construction phase.
- Driver training for HGV drivers and refresher course every six months for Project drivers
- Speed restrictions for project traffic travelling through communities (to be agreed with Traffic Management Authority)
- Run a safety campaign to improve the people’s knowledge of the traffic hazard on their roads, public information and other activities to address the issues.
- Run a pedestrian awareness programmed

Temporary signage

Temporary traffic signage shall be placed at appropriate places.

Other Recommendations

- It is important to manage public access routes during construction because it can cause delay to local traffic and create a safety hazard both on and offsite. People working and living near the project site would be annoyed by the emissions, noise and visual intrusion of queuing vehicles. Some important factors involved in access routes and site traffic are as follows:

Public Access Routes

- The use of public road for site access may be restricted in terms of:
 - Vehicle size, width and type of load
 - Time limits
 - Parking
 - Pedestrian conflicts
- Contractor should have consultation with the local police or local authority to address these issues and to effectively manage them before the beginning of the construction.

Site Workers Traffic

- Site personnel should not be permitted to park vehicles near the site boundary; this will lead to disruption in material deliveries. Designated parking area with appropriate parking space will be needed for this purpose; any plain area near construction site can be used for this purpose.

Site Rules

- Access to and from the site must be only via the specified entrance.
- On leaving the site, vehicles must be directed to follow the directions given.
- Drivers must adhere to the site speed limits.
- All material deliveries to site must keep allocated time limits.
- No material or rubbish should be left in the loading-unloading area.
- Develop a map for alternate routes showing material delivery services.
- Assign designated personnel on site to receive deliveries and to direct the vehicles.
- Monitor vehicle movement to reduce the likelihood of queuing or causing congestion in and around the area.
- Project vehicles should have a unanimous badge or logo on windscreen displaying that they belong to the project.

Contractor's Obligation

The traffic management plan of the Contractor should be safe enough and widening of access roads and construction of the detours must be completed before start of project construction activities so that heavy vehicular transportation for construction activities do not hinder the normal course of traffic lanes. While widening the access roads, the safe movement of the vehicles, people, animals must be ensured. It will be sole responsibility of Contractor. The roads widening

should be designed on the basis of the traffic survey, summarized and estimated site traffic. Contractor must ensure that road closures are carried out by a competent person. The Contractor obligation must include the display of traffic signs according to the need to divert the traffic volume and to guide the road users in advance. The traffic sign, traffic light should be placed from any diverting route or road marking.

The Contractor should consider the environmental and social impacts of the traffic during construction. It will be sole responsibility of the Contractor to implement a plan which produces minimum nuisance to the local people and to the environment. Safety of the people should be given due importance. It will be under Contractor obligation to notify the traffic management plan and its later changes to PM CSC, PIU, emergency services and Traffic Police, and also publish weekly programme in local newspapers.

Annexure 6 - Waste Management Plan

During construction/civil works potential sources of waste will include spoils generated during excavation activities, excavation waste for other civil works, domestic wastes (solid & wastewater), fuel or oil leakages or spills, onsite effluents from vehicle wash & cleaning, and cement spills.

Waste disposal of materials containing contents of both hazardous and non-hazardous nature such as scrap wood, bricks, concrete, asphalt, piping, insulation (asbestos and non-asbestos), metal scraps, oil, electrical wiring and components, chemicals, paints, solvents etc. can potentially become a serious environmental issue, particularly with the local contractors. To avoid any potential issue, the PIU in collaboration with focal agencies like TMA, District Coordination officer office will need to impose adequate internal controls.

Domestic wastes generated during construction of road will include sewage, grey water (from kitchen, laundry, and showers), kitchen wastes, combustible wastes and recyclable wastes from contractor camps.

Management Methodologies

- A waste management plan has been developed prior to the start of construction. This plan will cater to sorting of hazardous and non-hazardous materials prior to disposal, placing of waste bins at the project sites for waste collection and an onsite hazardous waste storage facility i.e. designated area with secondary containment.
- Licensed waste contractors will be engaged to dispose off all non-hazardous waste material that cannot be recycled or reused.
- Excavated material from trenches will be stored at site and it will be used as fill/cover material after laying of pipelines while access spoil shall be transported to spoil disposal site if required.
- Excavated material generated during construction of road will be used as a fill material at site and access spoil shall be transported to spoil disposal site if required.
- All types of combustible and non-combustible waste including plastic or glass bottles and cans will be temporarily stored on site and later sold/handed over to a waste/recycling contractor who will utilize these wastes for recycling purposes.
- Waste management training for all site staff to be included in Contractor's training plan.
- Fuel storage areas and generators will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area should be equal to 120% of the total volume of fuel stored.
- Fuel and hazardous material storage points must be included in camp layout plan to be submitted for approval. Hazardous material storage areas shall include a concrete floor to prevent soil contamination in case of leaks or spills. Fuel tanks will be checked daily for leaks and all such leaks will be plugged immediately.
- Designated vehicles/plant wash down and refueling points must be included in camp layout plan to be submitted for approval.
- Hazardous waste will be initially stored on site at designated area and then handed over to EPA certified contractor to final disposal.
- Record of waste generation and transfer shall be maintained by project contractors.
- Spill kits, including sand buckets (or other absorbent material) and shovels must be provided at each designated location.

- At the time of restoration, septic tanks will be dismantled and backfilled with at least 1m of soil cover keeping in view landscape of surrounding natural surface.
- It will be ensured that after restoration activities, the campsite is clean and that no refuse has been left behind.
- Clinical wastes will be temporarily stored onsite separately and will be handed over to approve waste contractor for final disposal.
- Training will be provided to personnel for identification, segregation and management of waste.

Annexure-7 - Chance Find Procedure

Guidelines for managing chance finds of suspected archaeological materials or human remains from any context are presented separately below:

Archeological Site (Initial Response)

Step 1: If known or suspected archaeological materials or features (either intact or disturbed) is encountered, stop construction in the immediate vicinity.

Step 2: Immediate steps will be taken to make worksite safe and prevent impact to archaeological materials. Do not move or transport soil from the vicinity of the find, including adjacent spoil material or material loaded into a truck.

Step 3: Contact the Project Manager for further guidance. If the Project Manager is not available, contact the alternate representative.

Initial Action by the Engineers or its Representative

Depending on the nature of the situation, one of the following responses by the Project Manager or its Representative is likely:

Based on a telephone description of the situation, it may be decided that there are no further concerns, allowing work to continue as planned.

A field visit by an archaeologist may be recommended.

Archaeological Site Management Options

Option 1: Avoidance through partial project redesign or relocation. This results in minimal impact to the archaeological site and is the preferred option from a cultural resource management perspective. It can also be the least expensive option from a construction perspective. An assessment would be required to determine the nature and extent of the chance find and test design options if necessary.

Option 2: Salvage archaeological excavation or screening.

Option 3: Monitoring of construction activities by a professional archaeologist. Monitoring is appropriate where project impacts cannot be predicted or evaluated before construction, especially near the margins of a known site, or in cases where deeply buried deposits are expected that cannot be accessed without the assistance of heavy machinery.

Human Remains (Initial Response)

If suspected human remains (either intact or disturbed) are encountered:

Step 1: Immediately stop construction in the vicinity of the remains. Do not move soil from the vicinity of the remains, including adjacent spoil material

Step 2: Take immediate steps to make the worksite safe and prevent impact to archaeological materials. Do not move or transport soil from the vicinity of the find, including adjacent spoil material or material loaded into a truck.

Step 3: Contact the Project Manager for further guidance. If the Project Manager is not available, contact the alternate representative of project manager.

Further Action Needed

An archaeologist or a designate that has specialized training in physical anthropology will visit the site as soon as possible. If it is determined that the remains are human and archaeological in nature, negotiations will follow to establish an appropriate procedure for handling the remains and if it is determined that the human remains are not archaeological in nature (i.e., forensic), the local policing authority and Office will provide guidance.

Archaeological Human Remains Management Options

Option 1: Avoidance through project redesign or relocation. This would protect the remains from further disturbance.

Option 2: Excavation to respectfully remove the remains with the help of archeological department.

Annexure 8 - Occupational Health And Safety Plan

GENERAL

Occupational Health and Safety covers all personnel working under the project and will be in line with the EHS guidelines on health and safety.

The Occupational Health and Safety program will aim to ensure that the workplace is safe and healthy by: addressing the hazards and risks at the workplace; outlining the procedures and responsibilities for preventing, eliminating and minimizing the effects of those hazards and risks; identifying the emergency management plans for the workplace or workplaces; and, specifying how consultation, training and information are to be provided to employees at various workplaces.

- Some of the risks/hazards associated with workplaces are due to working close to or at sites associated with the various project construction activities. Other risks associated with the project construction phase include risk of increase of vector borne and other different diseases.
- The following sections will be implemented during the construction phase to address and ensure workers' health and safety.

Screening and regular unannounced checking of workers

- As per the procedure for hiring workers, all contractors and labor agencies are required to make all prospective workers undergo medical tests to screen for diseases and sicknesses, prior to selection and employment of any worker. The contractor is also responsible for ensuring that no worker who has a criminal record is employed at the project site. It will be ensured that all workers undergo medical tests to screen diseases at source and at sites in consultation with the designated Health Officer.
- In addition to this, the PIU will also undertake sudden, unannounced checks on workers to look for diseases such as HIV, STDs, and hepatitis and take necessary steps as mandated by the Contractual agreement between the Contractor and the Worker(s).

Minimizing hazards and risks at the workplace.

To ensure safety at all work sites, the following will be carried out:

- Installation of signboards and symbols in risky and hazardous areas, to inform workers to be careful.
- Construction of barricades around construction sites and deep excavated pits, to cordon off and deter entry of unauthorized personnel and workers into these areas.
- Providing a safe storage site/area for large equipment such as power tools and chains, to prevent misuse and loss.
- Proper Housekeeping: Ensuring that materials are all stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse. Brick stacks will not be more than 7 feet in height and for concrete blocks they will not be more than 6 feet high.
- Removing all scrap timber, waste material and rubbish from the immediate work area as the work progresses.
- Where scaffolds are required, ensuring that each scaffold or its components shall be capable of supporting its own weight and at least 4 times the maximum intended load applied or transmitted to it. The platform/scaffold plank shall be at least 15 inches wide and 1.5 inches thick. The rope should be capable of supporting at least 6 times the maximum intended load

applied or transmitted to that rope. Pole scaffolds over 60 feet in height shall be designed by a registered professional engineer and shall be constructed and loaded in accordance with that design. Where scaffolds are not provided, safety belts/safety nets shall be provided;

- Ensure that all ramps or walkways are at least 6 feet wide, having slip resistance threads and not inclined at more than a slope of 1 vertical and 3 horizontals.
- Stacking away all excavated earth at least 2 feet from the pit to avoid material such as loose rocks from falling back into the excavated area and injuring those working inside excavated sites.
- Constructing support systems, such as bracing to adjoining structures that may be endangered by excavation works nearby.
- Install fire extinguishers and/or other fire-fighting equipment at every work site to prepare for any accidental fire hazards.

Provision of Personal Protective Equipment

- Risks to the health and safety of workers can be prevented by provision of Personal Protective Equipment (PPEs) to all workers. This will be included in the construction cost for each Contractor. Depending on the nature of work and the risks involved, contractors must provide without any cost to the workers, the following protective equipment:
- High visibility clothing for all personnel during road works must be mandatory.
- Helmet shall be provided to all workers, or visitors visiting the site, for protection of the head against impact or penetration of falling or flying objects.
- Safety belt shall be provided to workers working at heights (more than 20 ft.) such as roofing, painting, and plastering.
- Safety boots shall be provided to all workers for protection of feet from impact or penetration of falling objects on feet.
- Ear protecting devices shall be provided to all workers and will be used during the occurrence of extensive noise.
- Eye and face protection equipment shall be provided to all welders to protect against sparks.
- Respiratory protection devices shall be provided to all workers during occurrence of release of particulate matter, or vehicular emissions.
- Safety nets shall be provided when workplaces are more than 25 feet (7.5 m) above the ground or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors or safety belts is impractical.
- The specific PPE requirements for each type of work are summarized below.

PPE Requirement List

Type of Work	PPE
Elevated work	Safety helmet, safety belt (height greater than 20 ft.), footwear for elevated work.
Handling work safety	Helmet, leather safety shoes, work gloves.
Welding and cutting work	Eye protectors, shield and helmet, protective gloves.
Grinding work	Respirator, earplugs, eye protectors.
Work involving handling of chemical substances	Respirator, gas mask, chemical-proof gloves. Chemical proof clothing, air-lined mask, eye protectors.
Wood working	Hard hat, eye protectors, hearing protection, safety footwear, leather gloves and respirator.

Concrete and masonry work	Hard hat, eye protectors, hearing protection, safety footwear, leather gloves and respirator.
Excavation, heavy equipment, motor graders, and bulldozer operation	Hard hat, safety boots, gloves, hearing protection.

Procedures to Deal with Emergencies such as Accidents, Sudden Illness and Death of Workers

- First aid kits will be made available at all times throughout the entire construction period by the respective contractors. This is very important, because most work sites will be at some distance from the nearest hospital. In addition to the first aid kits, the following measures should be in place:

Provision of dispensaries by the individual contractor.

- A vehicle shall be on standby from the Project Office so that emergency transportation can be arranged to take severely injured/sick workers to the nearest hospital for immediate medical attention.
- A designated Health Officer/worker for the Project will be identified as a focal person to attend to all health and safety related issues. This employee’s contact number will be posted at all work sites for speedy delivery of emergency services. The focal person shall be well versed with the medical system and facilities available at the hospital.
- Communication arrangements, such a provision of radios or mobile communication for all work sites, for efficient handling of emergencies, will be made.

Record Maintenance and Remedial action

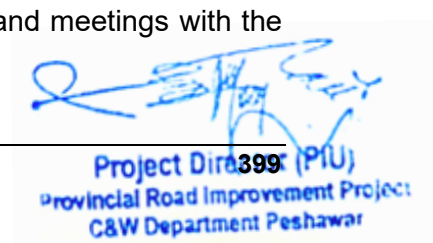
- The PIU will maintain a record of all accidents and injuries that occur at the work site. This work will be delegated by the contractor to the site supervisor and regularly reviewed every quarter by project management. Reports prepared by the contractor shall include information on the place, date and time of the incident, name of persons involved, cause of incident, witnesses present and their statements. Based on such reports, the management can jointly identify any unsafe conditions, acts or procedures and recommend for the contractor to undertake certain mitigate actions to change any unsafe or harmful conditions.

Compensation for Injuries and Death

- Any casualty or injury resulting from occupational activities should be compensated as per the local labor laws. Where compensation is sought by the injured party, proper procedures for documentation of the case will be followed, including a detailed report on the accident, written reports from witnesses, report of the examining doctor and his/her recommendation for treatment. Each individual contractor will be responsible for ensuring compensation for the respective workers.

Awareness Programs

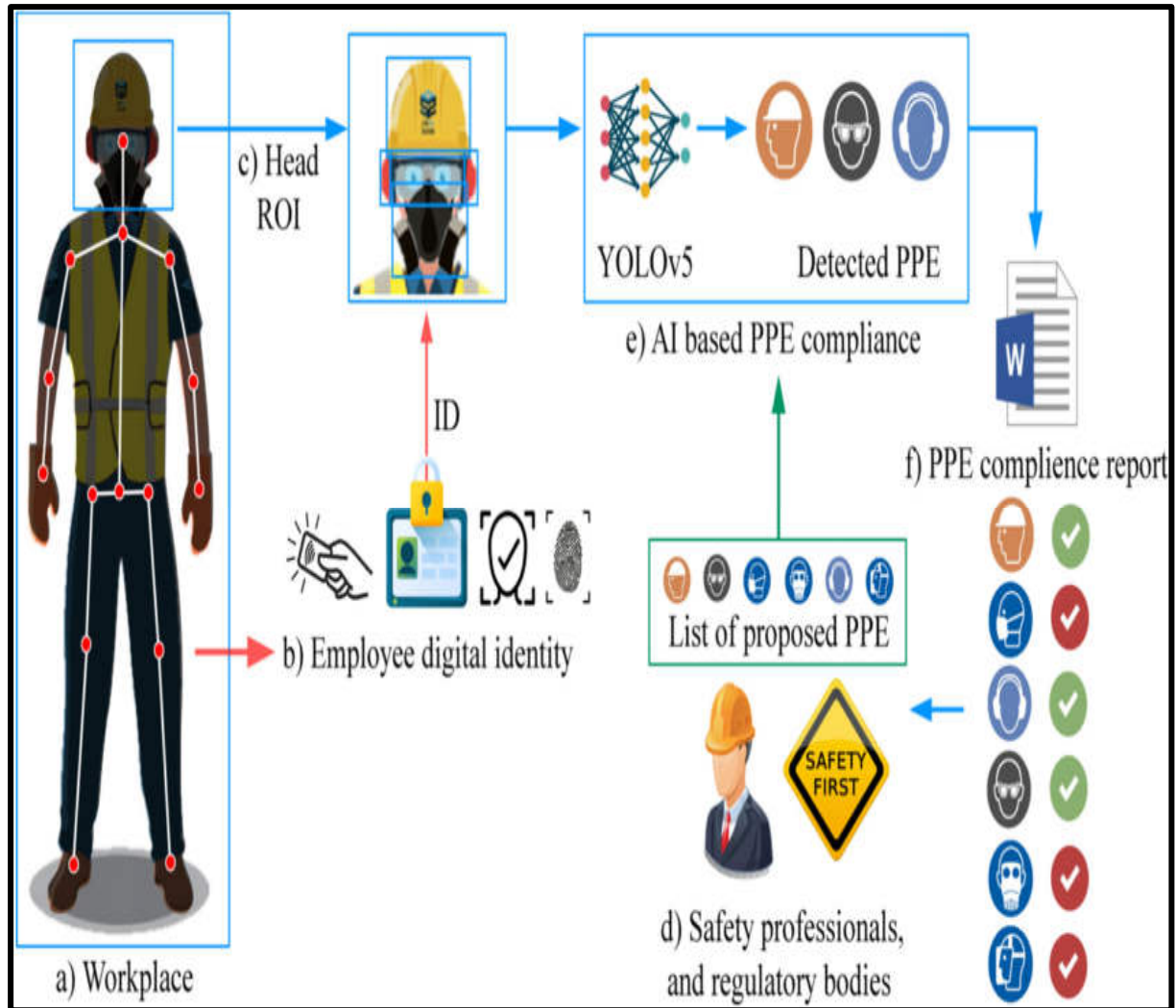
- The PIU will undertake awareness programs through posters, talks, and meetings with the contractors to undertake the following activities:



- Dissemination sessions will clarify the rights and responsibilities of the workers regarding interactions with local people (including communicable disease risks, such as HIV/AIDS), work site health and safety, waste management (waste separation, recycling, and composting), and the illegality of poaching.
- Make workers aware of procedures to be followed in case of emergencies such as informing the focal health person who in turn will arrange the necessary emergency transportation or treatment.

Nomination of a Health and Safety Focal Person

- Within each site (especially if different sites are being implemented by different contractors), a Health and Safety Focal Person will be appointed. The Terms of Reference for the focal person will mainly be as follows:
- Function as the focal person/representative for all health and safety matters at the workplace;
- Responsible for maintaining records of all accidents and all health and safety issues at each site, the number of accidents and its cause, actions taken and remedial measures undertaken in case of safety issues;
- Be the link between the contractor and all workers and submit grievances of the workers to the contractor and instructions/directives on proper health care and safety from the contractors back to the workers;
- Ensure that all workers are adequately informed on the requirement to use Personal Protective Equipment and its correct use;
- Also responsible for the first aid kit and making sure that the basic immediate medicines are readily available.



PPEs Management Plan

GENERAL GUIDELINES FOR HEALTH AND SAFETY

The following points are vital to a successful health and safety program:

- No person shall be instructed or required to work under conditions that are dangerous to their health.
- Each employee is responsible to carry out works in a safe manner, including the use of Personal Protective Equipment (PPE) when required and general personal safe work practices. Each employee shall report unsafe conducts of work, preventing avoidable accidents to site personnel. Reporting shall be made to the designated, safety representative (EHS), PM or SE on site.
- Worksite shall have person(s) available on site that can translate information in relevant languages when required.
- Inductions shall take place for each individual employed at the project site, together with visitors. The induction will identify the known site safety and health risks as well as mitigating measures.

Ensuring Site Safety

- The most valued resources are employees, the client and the communities. It must be dedicated to providing a safe and healthful environment for employees and customers, protecting the public, and preserving contractors' properties and assets.
- The Safety Plan will assist management and employees in controlling hazards and minimizing employee and customer injuries, damage to resident's property and damage to contractors, clients and community's properties.
- All employees of the project and sub-contractors will follow this program. Noncompliance to this program by employees or sub-contractors will result in one of the following:
- Verbal Warning; if minor violation (i.e. violation resulting in non-injury/damage)
- Written Warning; if second minor violation or minor injury/damage caused.
- Immediate dismissal; if third minor violation, or second minor injury/damage caused, or first Major injury/damage caused.
-

Engineering Personnel

- All Engineers, Service Provider Engineers and site personnel shall undertake training based upon this Safety Plan prior to startup of the project. Contractor shall employ an Engineer to undertake the task of monitoring safety (the post will be officially called "Health & Safety Engineer – hereinafter HSE").
- The HSE will report to the Project Manager. The role will include visiting all sites on a regular basis, conducting safety training, and ensuring all sites are functioning in accordance with the safety manual.
- Will conduct special trainings for leading site personnel and as well for the subcontractor's foreman, supervisor, engineers etc.
- Will brief all its workers and sub-contractors entering the worksite, if necessary on daily base. All names shall be recorded on an induction form and signed by the employees. It shall be highlighted that everyone has a duty of care with regards to safety.

Site Safety Meetings

Inductions

- Employees shall be provided a health and safety Induction by the assigned HSE prior to start of work. Inductions shall include:

- Personal requirements and responsibilities for accident prevention
- General policies outlined in this document
- Contractor (Safety Engineer) and Construction Supervision Engineer responsibilities for reporting all accidents
- Information relating to medical facilities/personnel and emergency responses
- Procedures for reporting and correcting unsafe conditions or work practices
- Relevant job hazards (Activity Hazard Analysis (AHA) may be presented)
- Upon completion of Inductions, each worker shall be assigned a specific number. This number will be displayed on the workers hard hat. The number will be filed on a master register with the name of the employee. The employee will be required to note his/her number on a daily log sheet (upon arrival and leaving), to show the Site Engineer or any other contractors representative in charge who is on site on each particular day. This has the added benefit of carrying out a number check should the site be evacuated.

Weekly Safety Meetings

- On a weekly basis the CSC consultant staff shall meet at the Site/Sub Office to discuss safety matters with the Contractors Quality and Safety representative. The meeting will follow an officially documented site safety inspection between the two representatives. The main issues raised noted in the inspections and within the meetings shall be recorded.
- The form “weekly safety assessment” has to be filled out by the contractors H&S rep. and submitted to the Construction Supervision Engineer.

Note: Meetings between contractor supervisors/foremen and workers will be encouraged to meet at least on a weekly basis, and if required on a daily basis, in the form of a “tool box talk”. Notes from this meeting may be presented in the weekly safety meetings with the MC/SC.

Monthly Safety Updates

- All workers, site supervisory staff and other relevant representatives shall meet every six months to discuss safety issues. These meetings will provide an opportunity to update the safety requirements, resolve safety concerns and improve general site safety conditions. If it is necessary to update in any occasion the contractor’s main management has to inform the CSC.

Annexure 9 - Emergency Response Plan

Purpose

The purpose of this Emergency Response Plan is to provide measures and guidance for the establishment and implementation of emergency preparedness plans for the project. The aim of the Emergency Response Procedure is to:

- (i) Ensure all personnel and visitors to the office/job sites are given the maximum protection from unforeseen events.
- (ii) Ensure all personnel are aware of the importance of this procedure to protection of life and property.

Emergency Preparation and Response Measure Scope

The emergency management program is applied to all Project elements and intended for use throughout the Project life cycle. The following are some emergencies that may require coordinated response.

- (i) Construction Accident
- (ii) Road & Traffic Accident
- (iii) Hazardous material spills
- (iv) Structure collapse or failure
- (v) Trauma or serious illness
- (vi) Sabotage
- (vii) Fire
- (viii) Environmental Pollution
- (ix) Loss of person
- (x) Community Accident

Responsibilities

The detailed roles and responsibilities of certain key members of the Emergency Response team available to assist in emergency are provided in **Table 1** below.

Table 1 Emergency Response Team

Action Group	Person Responsible	Responsibilities
Emergency Coordinator	Manager Site	Overall control of personnel and resources. The Emergency Coordinator will support and advise the Site Safety Supervision as necessary. Serves as public relations spokes persons, or delegates to some staff member the responsibility for working with news media regarding any disaster or emergency. Also assure proper coordination of news release with appropriate corporate staff or other designated people.
Site Safety Supervision (Emergency Commander)	Site EHS Officer	Overall responsibility for activating emergency plan and for terminating emergency actions. Be alternative of emergency response chairpersons.

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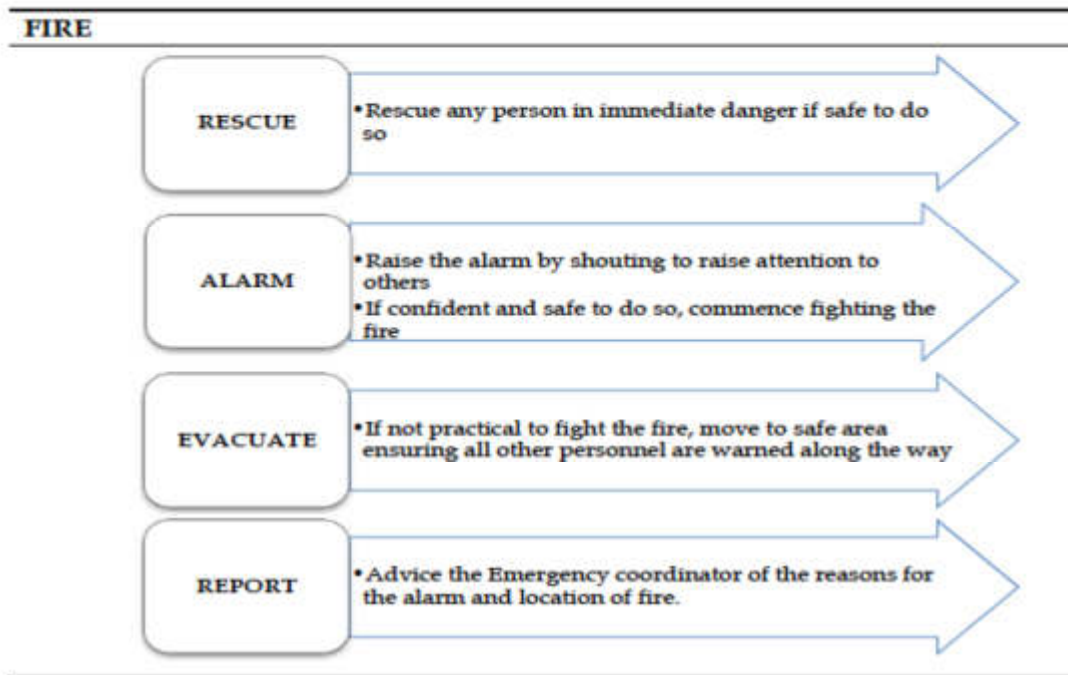
Action Group	Person Responsible	Responsibilities
		<p>Disseminates warnings and information as required to ensure all people in the immediate area have been warned and evacuated either by alarms or by word of mouth.</p> <p>Supervise the actions of the Emergency Response Team to ensure all persons are safe from the danger.</p> <p>Notify outside authorities if assistance is required.</p> <p>Carries the responsibility for coordinating actions including other organizations in accordance with the needs of the situation.</p> <p>Ensure maximum co-operation and assistance is provided to any outside groups called to respond to an emergency.</p> <p>Establish and appoint all emergency organization structure and team.</p> <p>Assures adequate delegation of responsibilities for all key positions of assistants on the Project to assist with any foreseeable emergency.</p> <p>Ensure resources available to purchase needed emergency response equipment and supplies.</p> <p>Assures that all persons on the Emergency Response Team aware and fully understand their individual responsibilities for implementing and supporting the emergency plan.</p> <p>Establish the emergency drill schedule of all identified emergency scenarios, track the status and evaluate the emergency.</p> <p>The Emergency Commander shall ensure that senior management personnel have been reported of the emergency as soon as practical after the event.</p>
Security Team	In charge Security or the person of security on duty	<p>Ensure that the exit route is regularly tested and maintained in good working order.</p> <p>Maintain station at the security gate or most suitable location to secure the area during any emergency such that only authorized personnel and equipment may enter, prevent access to the site of unauthorized personnel.</p> <p>Assist with strong/activation of services during an emergency.</p> <p>Ensure vehicles and obstructions are moved to give incoming emergency vehicles access to the scene, if ambulance or emergency services are attending the site, ensure clear access and personnel are located to direct any incoming emergency service to the site of emergency.</p>
Rescue & Medical Team	Certified CPR/Health Safety officer	<p>Protect the injured from further danger and weather.</p> <p>Provide treatment to the victim(s) to the best of their ability by first aid and then transfer to hospital.</p> <p>Remain familiar with the rescue activities and rescue apparatus.</p> <p>Assist outside medical services personnel when they arrive</p>

Action Group	Person Responsible	Responsibilities
General Administration Team		Response to support any requested general facilities for assisting Emergency Response Team in their work.
Environment Team	Environment Specialist at site	In case of emergency related to the environmental pollution such as the chemical spill, oil spill into the ambient, the environment team will support the technical advice to control and mitigate the pollution until return to the normal situation.
Other Staff and Employees	All workers at site	All other staff and employees will remain at their workstations or assembly point unless directed otherwise from Emergency Response Team. Each supervisor will ensure that all members of his work group are accounted for and keep in touch with each of their Department Head.

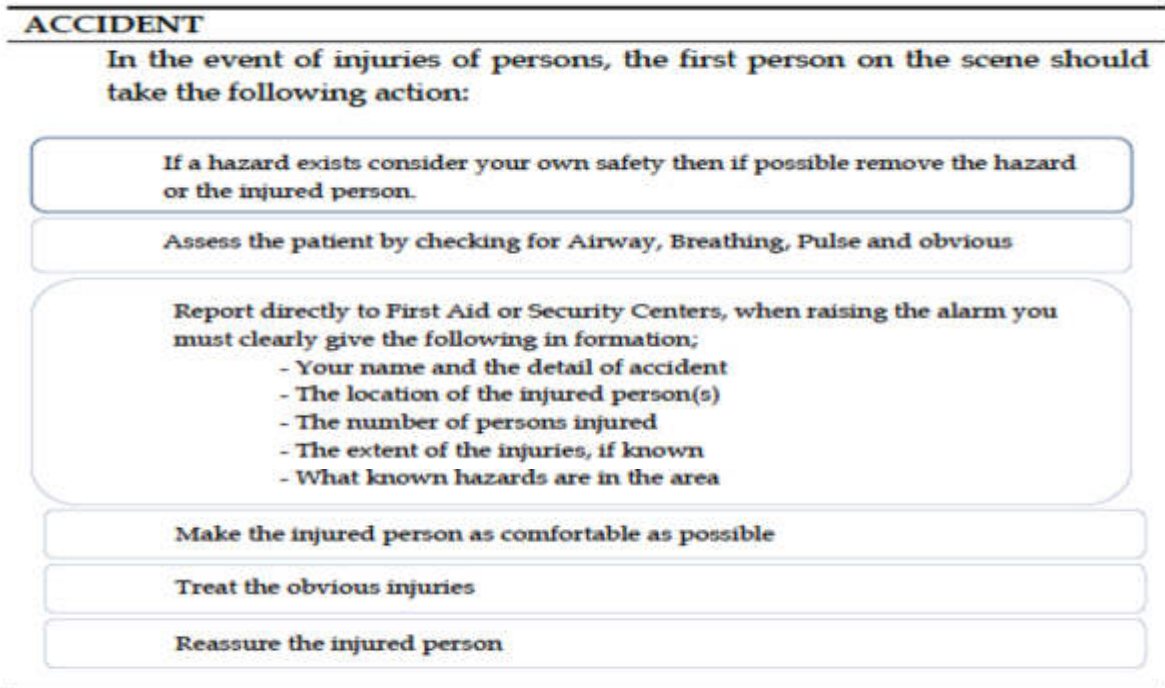
PROCEDURE

Emergency situation and injuries to person can occur at any time or place either on Project site or elsewhere. The most two common types of emergencies on site are fire and serious accident.

Emergency Procedure for Fire



Emergency Procedure for Serious Accident



Communication With Authorities / Press At Site

In the event of an accident or incident, only senior staff is permitted to give factual information to the authorities for resource of liability exposure. The press must be avoiding politely, at all costs, with the terse comment that “the matter is under investigation and relevant information when available will be provided by our Head Office” Do not ever give your opinion or story.

First Aid Persons

- Upon advice of medical emergency, make immediate assessment to response required and if necessary, advise security to summon ambulance or medical assistance, the qualified first aid attendant should also,
- Provide treatment to the victim(s) to the best of his/her ability.
- Ensure the safety of victims by ceasing any work activity in the area.
- Protect the injured from further danger and weather.
- Assist medical services personnel when they arrive.

General Administration Team

- Upon advice of medical emergency, maintain contact with first aid personnel and summon ambulance if required.

Security Team

- If ambulance or emergency services are attending the site, ensure clear access and personnel are located to direct vehicle closest to the scene.
- Prevent access to the site of unauthorized personnel (press, etc.).

Emergency Coordinator

- The Emergency Coordinator shall assist emergency personnel at the scene as required through allocation of company resources.
- The Emergency Coordinator shall ensure next-of-kin are properly notified as soon as possible and give whatever company support and assistance is necessary to assist them bundle the situation.

ANNEXURE – D
**LAND ACQUISITION AND
RESETTLEMENT
FRAMEWORK**



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Land Acquisition and Resettlement Framework

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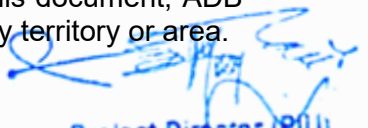
July 2024

Pakistan: Khyber Pakhtunkhwa Rural Roads Development Project

Prepared by Project Management Unit (PMU) with assistance of Project Management Consultants (PMC) engaged by the Communication and Works Department Government of Khyber Pakhtunkhwa for the Asian Development Bank (ADB)

This Land Acquisition and Resettlement Framework is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or Staff, and may be preliminary in nature. Your attention is directed to the "[terms of use](#)" section of ADB's website.

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**GOVERNMENT OF KHYBER PAKHTUNKHWA
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No. 12178/40-RRDP

Dated: 10/07/2024

To,

Mr. Khurram Ghaffoor
Senior Project Officer (Infrastructure)
Asian Development Bank
Pakistan Resident Mission
Level 8, North Wing
Serena Office Complex
Kayaban-e-Suharwardi, G-5,
Islamabad

SUBJECT:- KHYBER PAKHTUNKHWA RURAL ROAD DEVELOPMENT PROJECT (KP-RRDP): SAFEGUARD DOCUMENTS

Enclosed please find herewith final version of safeguard documents (SDDR and LARF) for information and disclosure, please.


PROJECT DIRECTOR (PIU) - PRIP
C&W Department Peshawar.

Copy for information:

- The Secretary, Communication and Works Department, Peshawar


Project Director (PIU)
Provincial Road Improvement Project
C&W Department Peshawar

CURRENCY EQUIVALENTS

(As of 25 May 2024)

Currency Unit – Pakistan rupee/s (PKR)


PKR1.00 = \$0.00359124

\$1.00 = PKR 278.02



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ABBREVIATIONS

ADB	-	Asian Development Bank
BOR	-	Board of Revenue
CAP	-	corrective action plan
CNIC	-	computerized national identity card
CSO	-	civil society organization
C&W	-	Communication and Works
DC	-	District Coordinator (also District LAC)
DDE	-	Deputy Director, Environmental and Social Cell
DMS	-	detailed measurement survey
EMP	-	environmental management plan
DP	-	displaced person
EA	-	executing agency (C&W)
ESC	-	Environment and Social Cell
GRC	-	grievance redress committee
GRM	-	grievance redress mechanism
IA	-	implementation agency
IOL	-	inventory of losses
IP	-	indigenous people
IPDP	-	indigenous peoples development plan
IR	-	involuntary resettlement
KP-RRDP	-	Khyber Pakhtunkhwa Rural Road Development Project
LAA	-	Land Acquisition Act, 1894
LAC	-	(district) land acquisition collector
LAR	-	land acquisition and resettlement
LARF	-	land acquisition and resettlement framework
NGO	-	non-governmental organization
OPL	-	official poverty line
PD	-	project director
PIU	-	project implementation unit
PMCS	-	project management construction supervision consultant
RC	-	replacement cost
RP	-	resettlement plan
SES	-	socio economic survey
SIA	-	social impact assessment
SDDR	-	social due diligence report
SPS	-	Safeguard Policy Statement, 2009 (ADB)
VLA	-	valuation of lost assets



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DEFINITION OF TERMS

Displaced Persons	In the context of involuntary resettlement, displaced persons are those who are physically displaced (relocation, loss of residential land, or loss of shelter) and/or economically displaced (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or access to legally designated parks and protected areas.
Cut-off-Date	The completion date of the census of project-displaced persons is usually considered the cut-off date. Cut-off date is normally established by the borrower government procedures that establish the eligibility for receiving compensation and resettlement assistance by the project displaced persons. In the absence of such procedures, the borrower/client will establish a cut-off date for eligibility.
Entitlements	Range of measures comprising compensation, income restoration, transfer assistance, income substitution, and relocation, which are due to displaced persons, depending on the nature of their losses, to restore their economic and social base.
Economic Displacement	Loss of land, assets, access to assets, income sources, or means of livelihood because of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or access to legally designated parks and protected areas.
Encroachers	People who have trespassed onto Public/ Private/ Community land to which they are not authorized. If such people arrived before the entitlements cut-off date, they are eligible for compensation
Involuntary Resettlement:	Land and/or asset loss, which results in a reduction of livelihood level. These losses must be compensated for so that no person is worse off than they were before the loss of land and/or assets.
Physical displacement	Means relocation, loss of residential land, or loss of shelter because of (i) involuntary acquisition of land, or (ii) involuntary restrictions or land use or on access to legally designated parks and protected areas.
Meaningful Consultation	The process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) gender-inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision makings, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.
Carriageway	The part of the road that is available for traffic. It does not include the shoulders.
Construction limit	The maximum extent of the area in which the contractor may work.
Corridor of impact	This is the area that is likely to be physically affected by the construction, including locations adjacent to the actual construction that may be affected by noise, vibration, etc.
Formation width	The outer boundary of the construction including the embankment (if any).
Pavement width	Generally understood to be the width of the carriageway but may include the shoulders if these are sealed.


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I. INTRODUCTION

1. In Khyber Pakhtunkhwa (KPK) Province, rural roads are crucial for connecting areas to district centers and essential services like markets, healthcare, and education. However, recent World Bank research reveals disparities in the development of these roads, with many being non-existent, unpaved, or in poor condition. This inequality affects access to education, healthcare, and markets, particularly in the northern and southern districts compared to the central districts. Even in central districts, rural roads connecting urban centers often need improvement. Additionally, 90% of the province's population lives within a two-hour distance from urban centers, indicating the importance of efficient road networks. Only four districts meet international standards for road density, with northern and southern districts having very low densities. Most central districts fall short of these standards, highlighting the need for improvement.

2. The province maintains a rural road network spanning 21,679 km overseen by the Communications & Works (C&W) Department. Of this network, 72% serves 30 million inhabitants across 25 established districts while 28% serves 5 million in the 13 Merged Districts. Approximately 41% of the roads are in poor condition, with an additional 30% expected to deteriorate without timely maintenance (2013, C&W RAMS Study). Districts in the north and south have a higher proportion of roads in fair to poor conditions. Additionally, nearly 19% of the network remains unpaved, requiring extensive rehabilitation and periodic maintenance.

3. In Khyber Pakhtunkhwa, 85% of the population resides in rural areas, facing declining access to public services. Geographical challenges, particularly in the northern and southern districts, hinder service delivery. Nearly 40% of rural residents spend over an hour traveling to healthcare facilities, while accessing primary, middle, and secondary schools also require significant travel time. The poor road network condition exacerbates safety risks and transport costs. Inadequate roads and transport services further contribute to disparities in accessing education facilities, necessitating reliance on walking or private vehicles. Despite its tourism potential, the region faces accessibility challenges.

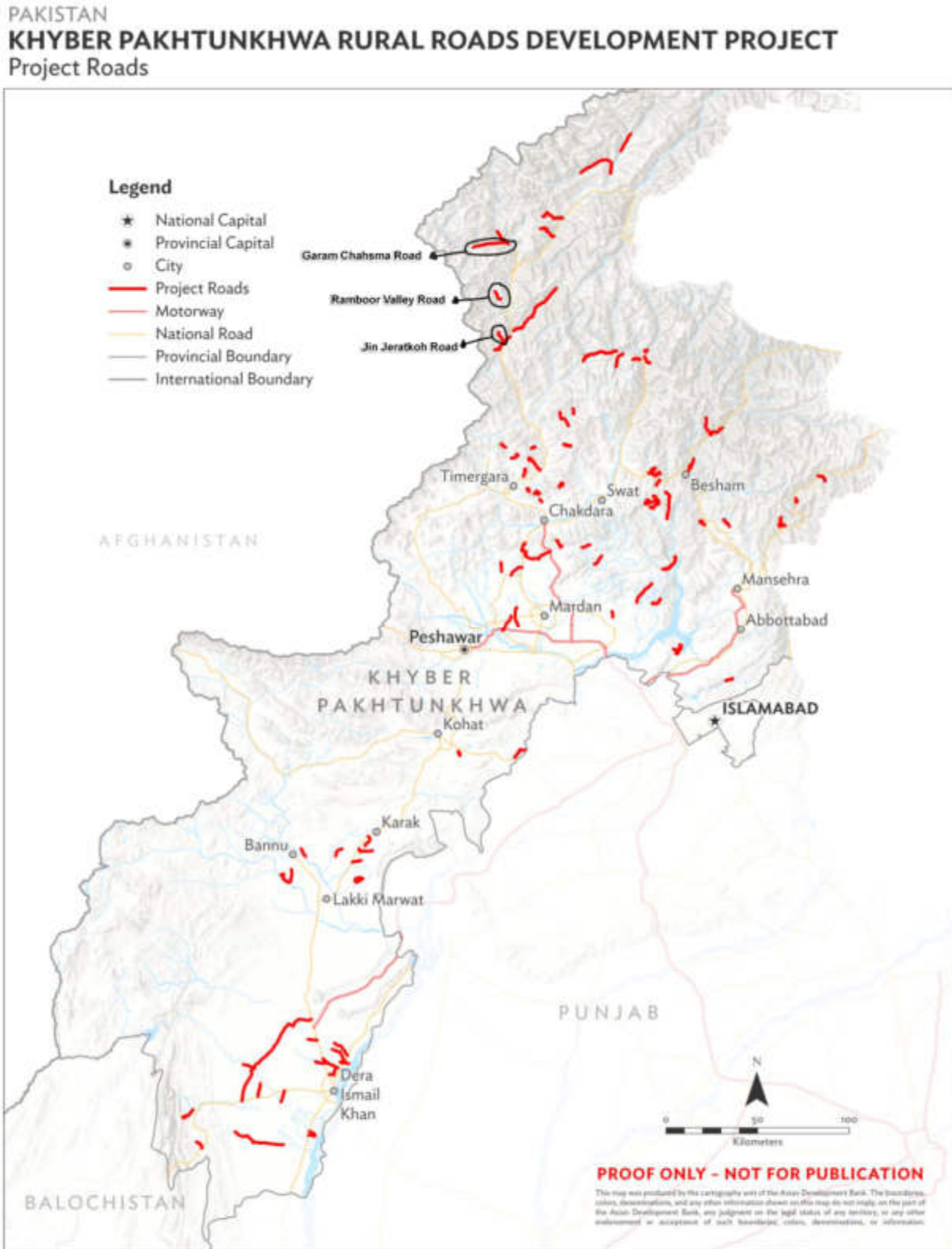
A. Project Overview and Components

4. The project is designed to provide safe and resilient access to users. This includes implementing traffic safety regulations, maintaining road conditions, providing adequate signage, and lighting that enhance safety. Similarly, it includes measures to withstand floods, earthquakes, and hurricanes to maintain access during emergencies. The project entails the rehabilitation and improvement of 89 rural access roads totaling 324.4 km in length, flood-affected roads covering 435.4 km and tourism access roads spanning 182.3 km. Additionally, 32 bridges will be rehabilitated to facilitate cross drainage & canal communication and general transportation. The design specifications include formation width of 6.7 meters (22 feet), 5.505 meters (18 feet) wide carriageway, 0.6 meters (2 feet) wide shoulder on either side and 0.6-meter (2 feet) drain on both sides in open area. In built-up areas, the carriage way is 4.6 meters wide (15 feet) and drains 0.6 meters (2 feet) on both sides. The project location map is shown in Figure-1.



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Figure-1: Location map of the project area




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B. Purpose and Scope of LARF

5. This land acquisition and resettlement framework (LARF) applies to the entire KP-RRDP considering the possibility of unanticipated impacts. LARF will guide the project on what to do in case of unanticipated impacts and what standards/entitlements will be provided to those affected, define who will be responsible for the funds and implementation of a resettlement plan (RP) or corrective action plan (CAP) and conditionalities for starting/continuing with the works. The PIU will ensure that construction work is not initiated in the affected area until the adverse impact is mitigated as per LARF followed by the preparation and full implementation of a RP which will be validated by the Resettlement Specialist of PMCSC and PIU. The LARF defines the institutional arrangements, legal and policy framework, eligibility criteria and entitlements for displaced persons. It sets out procedures for resettlement planning and implementation, including further project IR screening; social impact assessment; consultation, participation, and disclosure; grievance redress; monitoring and reporting; as well as the institutional and financial arrangements for LAR.

6. The LARF has been endorsed by the EA for application and implementation for all 89 roads and 32 bridges, especially 28 roads where the design was compromised. The LARF also presents adjusted design specifications that enable the avoidance of all resettlements impacts where there is potential to involve the LAR impacts during the construction stage.

II. SCOPE OF LAND ACQUISITION AND RESETTLEMENT (LAR)

7. All civil works will be confined within the existing right-of-way (ROW). The final design aimed at avoiding all IR impacts and damage to roadside structures that have encroached into the ROW by adjusting the construction in 89 road sections. Hence, no IR impacts are expected from the construction work. The adjustments are documented in the social due diligence report (SDDR). Contractors will be required to comply with these adjustments. Prior to contract award, the SDDR will be updated following official confirmation of the available ROW by the respective revenue districts. In case IR impacts are identified, a resettlement plan will be prepared and implemented before works will be allowed in the section with impacts. Likewise, if unanticipated IR impacts emerge during construction, a corrective action plan (CAP) will be prepared and implemented before civil works will be allowed in the sections with impacts.

A. Involuntary Resettlement (IR) Category

8. The EA is committed to confining construction activities within the existing limits of the ROW or as needed, within the dimensions of the current blacktop carriageway to mitigate any adverse impacts on adjacent structures, irrespective of their typology. Concurrently, the EA is engaged in securing confirmation of ROW ownership from the concerned authorities make it condition with the contract award, aligning with its proactive measures to preclude any LAR impacts throughout the project's implementation. Despite these measures, the possibility of impact or damage to structures within the encroached segments of the ROW cannot be entirely excluded. Therefore, a prudent safeguard approach necessitates the classification of the proposed project as Category B for involuntary resettlement (IR) under ADB's guidelines. This acknowledges the potential for unforeseen LAR impacts during the execution phase. The LARF will guide the project on what to do in case of impacts and what standards/entitlements will be provided to those affected, define who will be responsible for the funds and implementation of the RP or CAP and conditionalities for starting/continuing with the works.



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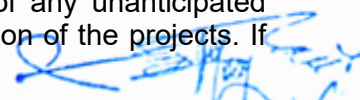
B. Indigenous Peoples Category

9. The entire population in the project area is Muslim and no group cannot be considered indigenous peoples as per ADB's SPS 2009. The project area also encompasses the district of Chitral, home to Indigenous Peoples residing in the Kalash valley. However, the nearest project roads are located more than 40 km to the Kalash valley. It is confirmed that there is no negative impact on the indigenous community owing to the execution of the project activities. As the project will not impact on indigenous peoples, the project is classified as category C for IP. An indigenous peoples development plan (IPDP) is not required for this project.

III. LAR REQUIREMENTS FOR CONTRACT AWARD AND IMPLEMENTATION

10. The following LAR related conditions and actions will apply for KP-RRDP:

- (i) Contract award signing will be conditional to the submission of the final SDDR and its approval by ADB. The final SDDR shall include: (i) the ROW confirmation letter from the revenue districts; (ii) re-verification, confirmation and documentation of the absence of IR impacts; (iii) confirmation of the establishment/notification and orientation of the GRCs; and (iv) documentation of the consultations and information dissemination conducted on the project scope/schedule, and project grievance redress mechanism (GRM).
- (ii) To avoid any form of new encroachment, PIU will communicate with local communities both before the contract is awarded and prior to the commencement of civil work to urge communities not to engage in any new form of encroachment.
- (iii) Orientation of Contractors on SDDR/LARF: PIU/PMCSC before the initiation of civil work, will provide the orientation to contractors on the SDDR/LARF, grievance redress mechanisms and other contractual requirements related to social safeguard and core labor standards. Contractors will also be required to establish their GRM for its workers and communities and disseminate information about their GRM to communities and workers, designate a grievance redress focal, and maintain their respective grievance log to record all complaints received and the status of their resolutions.
- (iv) Meaningful consultation must be conducted on a regular basis with the local population, ensure their concerns and any grievances are properly addressed and reported in the periodic report. Consultation with women from communities shall be arranged in culturally appropriate manner to ensure women participate and heard.
- (v) Starting from the project effectiveness, social monitoring of project implementation will be conducted to (i) document unanticipated impacts that may arise during construction, (ii) report on the consultation, information disclosure and community-liaison work conducted, (iii) and document the operations of the grievance redress in the project. Semi-annual social monitoring reports (SMRs) will be submitted by the PIU/PMCSC to ADB for review and disclosure. Each social monitoring report will prominently and regularly indicate the re-verification and confirmation of the absence of IR impacts. In case potential impacts are identified, a resettlement plan will be prepared and implemented prior to commencement/resumption of civil works in components/sections of the subproject with the identified IR issues. Submission of semi-annual social monitoring reports will continue throughout the project implementation period.
- (vi) Contractors shall be required to provide a written notice of any unanticipated resettlement risks or impacts that arise during the construction of the projects. If


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any such impacts are found, these will be addressed according to LARF and ADB's SPS 2009. The PIU will ensure that construction work is not initiated in the affected area until the adverse impact is mitigated as per LARF followed by the preparation and fully implementation of a RP which will be validated by the Resettlement Specialist of PMSC and PIU.

IV. LEGAL AND POLICY FRAMEWORK

A. LAR Legal and Policy Framework

11. This LARF has been prepared in light of Pakistan's laws relevant to land acquisition and resettlement and ADB's SPS 2009 for involuntary resettlement (IR). To resolve any gaps between the two set of instruments, i.e. Pakistan's Land Acquisition Act 1894 (LAA) and ADB's SPS 2009 the framework provides measures to reconcile and address the gaps in a manner consistent with SPS's compliance requirements.

B. Pakistan's Law and Regulatory System for Land Acquisition and Resettlement

12. The Land Acquisition Act 1894 (LAA 1894) with its successive amendments is the main law regulating land acquisition for public purpose projects at federal and provincial levels through the right of exercise of eminent domain. The LAA has been variously interpreted by provincial governments, and some provinces have augmented the LAA by issuing provincial legislations. In KP Province, valuation is done by District Collector/ District Commissioner and provides for 15% compulsory acquisition surcharge on top of the value of the land. The LAA, nevertheless, requires that following an impacts assessment/valuation effort, land and crops are compensated in cash at market rate to titled landowners and registered land tenants/users, respectively. The LAA mandates that land valuation is to be based on the latest three (3) years average registered land sale rates, though, in several recent cases the median rate over the past 1 year, or even the current rates, have been applied.

13. Based on the LAA, only legal owners and tenants registered with the Land Revenue Department or with formal lease agreements are eligible for compensation/livelihood support. For those without title rights, there are no laws in Pakistan either at federal or at provincial levels that consider non-titleholders for compensation. The LAA does not openly or automatically mandates for specific rehabilitation/ assistance provisions benefiting the non-titleholders including poor, vulnerable groups, or severely affected DPs including tenants, sharecroppers, encroachers and squatters, nor does it overtly provide for rehabilitation of income/livelihood losses or resettlement costs. Nevertheless, for development projects financed internationally (by international financial institutions-IFIs or bilateral and multilateral lending institutions) in Pakistan, non-titleholder affectees have been paid compensation/assistance for lost incomes and assets as an ad hoc arrangement as agreed between the EA and DPs during consultation meetings. Examples of such development projects are those funded by ADB, World Bank and other lenders in energy, urban, transport sectors.

14. LAA deals with matters related to the acquisition of private land and other immovable assets that may exist on it when the land is acquired for public purposes. It is unlikely that LAA will be triggered in KP-RRDP since all works are expected to be done within the existing ROW and acquisition of private land will be avoided as much as possible. Table 4-1 below elaborates salient features of the LAA sections pertinent to acquisition of land. The right to acquire land for


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public purposes is established when Section 4 of the LAA is notified. The LAA specifies a systematic approach for acquisition and compensation of land and other properties for development projects. It stipulates various sections pertaining to notifications, surveys, acquisition, compensation and apportionment awards along with dispute resolution, penalties and exemptions. Surveys for land acquisition are to be disclosed to the displaced persons.

Table 4-1: Salient Features of Pakistan's LAA 1894

Section 4	Publication of preliminary notification and power for conducting survey.
Section 5	Formal notification of land needed for a public purpose. Section 5a covers the need for enquiry of the concerns or grievances of the affected people related to land prices.
Section 6	The Government makes a more formal declaration of intent to acquire land.
Section 7	The Land Commissioner shall direct the Land Acquisition Collector (LAC) to take order for the acquisition of the land.
Section 8	The LAC has then to direct that the land acquired to be physically marked out, measured, and planned.
Section 9	The LAC gives notice to all DPs that the Government intends to take possession of the land and if they have any claims for compensation then these claims are to be made to them at an appointed time. (At this stage, an acquaintance rolls of DPs indicating the amount and share in compensation for affected assets is prepared).
Section 10	Delegates power to the LAC to record statements of the DPs in the area of land to be acquired or any part thereof as co-proprietor, sub proprietor, mortgage, and tenant or otherwise.
Section 11	Enables the Collector to make enquiries into the measurements, value and claim and then to issue the final "award". The award includes the land's marked area and the valuation of compensation.
Section 11 A	Enable the Collector to acquire the land through the private negotiation.
Section 16	When the LAC has made an award under Section 11, he will then take possession and the land shall thereupon vest absolutely in the Government, free from all encumbrances.
Section 17	Emergency clause that allows acquisition of land prior to compensation of DPs. This clause will not be applied in KP-RRDP.
Section 18	In case of dissatisfaction with the award, DPs may request the LAC to refer the case onward to the court for a decision. This does not affect the Government taking possession of land.
Section 23	The award of compensation to the title holders for acquired land is determined at i) its market value of land, ii) loss of standing crops, trees and structures, iii) any damage sustained at the time of possession, iv) injurious affect to other property (moveable or immovable) or his earnings, v) expenses incidental to compelled relocation of the residence or business and vi diminution of the profits between the time of publication of Section 6 and the time of taking possession plus 15% premium in view of the compulsory nature of the acquisition for public purposes.
Section 28	Relates to the determination of compensation values and interest premium for land acquisition.
Section 31	Section 31 provides that the LAC can, instead of awarding cash compensation in respect of any land, make any arrangement with a person having an interest in such land, including the grant of other lands in exchange.
Section 48A (LAA-1986)	If within a period of one year from the date of publication of declaration under Section 6 in respect of any land, the Collector has not made an award under Section 11 in respect to such land, the owner of the land

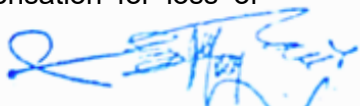

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	shall, unless he has been to a material extent responsible for the delay be entitled to receive compensation for the damage suffered by him as a consequence of the delay.
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C. ADB's Safeguard Policy Statement 2009

15. The SPS 2009 is based on the following objectives: to avoid involuntary resettlement wherever possible; to minimize involuntary resettlement by exploring project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups. The following principles are applied to reach these objectives:

- (i) Screen the project early on to identify past, present, and future involuntary resettlement impacts and risks. Determine the scope of resettlement planning through a survey and/or census of displaced persons, including a gender analysis, specifically related to resettlement impacts and risks.
- (ii) Carry out meaningful consultations with affected persons, host communities, and concerned nongovernment organizations. Inform all displaced persons of their entitlements and resettlement options. Ensure their participation in planning, implementation, and monitoring and evaluation of resettlement programs. Pay particular attention to the needs of vulnerable groups, especially those below the poverty line, the landless, the elderly, women and children, and Indigenous Peoples, and those without legal title to land, and ensure their participation in consultations. Establish a grievance redress mechanism to receive and facilitate resolution of the affected persons' concerns. Support the social and cultural institutions of displaced persons and their host population. Where involuntary resettlement impacts and risks are highly complex and sensitive, compensation and resettlement decisions should be preceded by a social preparation phase.
- (iii) Improve, or at least restore, the livelihoods of all displaced persons through (i) land-based resettlement strategies when affected livelihoods are land based where possible or cash compensation at replacement value for land when the loss of land does not undermine livelihoods, (ii) prompt replacement of assets with access to assets of equal or higher value, (iii) prompt compensation at full replacement cost for assets that cannot be restored, and (iv) additional revenues and services through benefit sharing schemes where possible.
- (iv) Provide physically and economically displaced persons with needed assistance, including the following: (i) if there is relocation, secured tenure to relocation land, better housing at resettlement sites with comparable access to employment and production opportunities, integration of resettled persons economically and socially into their host communities, and extension of project benefits to host communities; (ii) transitional support and development assistance, such as land development, credit facilities, training, or employment opportunities; and (iii) civic infrastructure and community services, as required.
- (v) Improve the standards of living of the displaced poor and other vulnerable groups, including women, to at least national minimum standards. In rural areas provide them with legal and affordable access to land and resources, and in urban areas provide them with appropriate income sources and legal and affordable access to adequate housing.
- (vi) Ensure that displaced persons without titles to land or any recognizable legal rights to land are eligible for resettlement assistance and compensation for loss of nonland assets.


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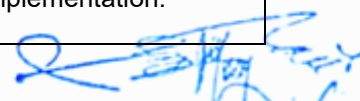
- (vii) Prepare a resettlement plan elaborating on displaced persons' entitlements, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget, and time-bound implementation schedule.
- (viii) Disclose a draft resettlement plan, including documentation of the consultation process in a timely manner, before project appraisal, in an accessible place and a form and language(s) understandable to affected persons and other stakeholders. Disclose the final resettlement plan and its updates to affected persons and other stakeholders.
- (ix) Conceive and execute involuntary resettlement as part of a development project or program. Include the full costs of resettlement in the presentation of project's costs and benefits. For a project with significant involuntary resettlement impacts, consider implementing the involuntary resettlement component of the project as a stand-alone operation.
- (x) Pay compensation and provide other resettlement entitlements before physical or economic displacement implement the resettlement plan under close supervision throughout project implementation.
- (xi) Monitor and assess resettlement outcomes, their impacts on the standards of living of displaced persons, and whether the objectives of the resettlement plan have been achieved by taking into account the baseline conditions and the results of resettlement monitoring. Disclose monitoring reports.

D. Comparison of Key Principles and Practices of Pakistan's LAA and ADB's IR Safeguards-SPS 2009

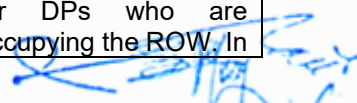
16. A comparison of Pakistan's Land Acquisition Act of 1894 (LAA) and ADB's Policy on Involuntary Resettlement (IR) shows that there exist differences in the two instruments. ADB SPS 2009 requirements that are not mandated in Pakistan's regulations include: (i) the need to screen the project early on the planning stage (ii) requirement to carry out meaningful consultation (iii) at the minimum restore livelihood levels to the pre-project conditions and improve the livelihoods of the affected vulnerable groups (iv) prompt compensation at full replacement cost is to be paid prior to displacement (v) provide displaced people with adequate assistance (vi) ensure that displaced people who have no statutory rights to the land that they are working are eligible for resettlement assistance and compensation for the loss of no-land assets and (vii) requirement disclose resettlement plans and resettlement monitoring reports. Table 4-2 below presents a gap-analysis between the Pakistan's LAA and ADB's SPS 2009.

Table 4-2: Comparison of LAA and ADB's SPS 2009

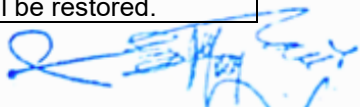
IR Policy	Pakistan's Land Acquisition Act of 1894	ADB IR Safeguards-SPS 2009	Gap Filling Measure in the KP-RRDP
IR Policy	The government does not have a national or provincial policy on resettlement and rehabilitation of affected persons.	ADB Safeguard Policy Statement provides a policy on involuntary resettlement with principles, objectives, and procedures for implementation	All DPs will be entitled to rehabilitation assistance.
LAR Planning	Provides specific steps from initial notification, seeking objection, measurements and demarcation, valuation and further notifications on the until land award. However, there is no	Preparation of draft and final RP	RPs/CAPs will be prepared in case unanticipated impacts are identified during project implementation.


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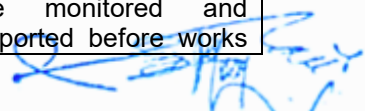
IR Policy	Pakistan's Land Acquisition Act of 1894	ADB IR Safeguards-SPS 2009	Gap Filling Measure in the KP-RRDP
	requirement for the preparation of LARP.		
Consultation, information and participation of DPs	No specific requirement. The decisions regarding land acquisition and the rate/amount of compensation to be paid are published in the official Gazette which is notified in accessible places so that the people affected are informed	Meaningful consultation, timely disclosure of relevant information and participation in LAR planning	Consultations with DPs, with special attention to vulnerable groups/households will be conducted as part of RP/CAP preparation and implementation.
Disclosure of LARP	There is no law or policy that requires preparation and disclosure of LARPs. However, several general and targeted notifications are included in the land acquisition process from the notification of Section 4 until the notice of land award.	Disclosure of draft & final LARP to DPs and on ADB website	RPs will be disclosed to DPs and to the EA and ADB website
Grievance redress	Established under LAA through the formal land acquisition process at a point in time or through appeals to the court. Land Acquisition Collector (LAC) is the pre-land award authority to make decision on objections.	Establish GRM scaled to risks and impacts of project at project and field levels.	GRM will be established under the project. Existence of the GRM will be widely communicated in the project area.
Assessment of social impacts	Includes the conduct of demarcation/measurement of the affected assets. Also includes assessment of related impacts to acquisition including diminution of profits, injurious affect to other property (moveable or immoveable) or his earnings, and expenses incidental to compelled relocation of the residence or business as required under Section 23. However, there is no requirement in LAA to assess vulnerability of the DPs or impacts on host communities.	Census, socio-economic survey, detailed measurement survey and valuation of lost assets	Socio-economic surveys, DMS and VLA will be conducted as part of RP/CAP preparation.
Cut-off date	At the time of issuance of section 4 under LAA	Eligibility for entitlements under this LARF is limited by a cut-off date, determined at the time of social impacts assessment (SIA) survey,	The conduct of the surveys will be used as cut-off date particularly for DPs who are occupying the ROW. In


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IR Policy	Pakistan's Land Acquisition Act of 1894	ADB IR Safeguards-SPS 2009	Gap Filling Measure in the KP-RRDP
		census of displaced persons (DPs), inventory of losses (IOL) and socioeconomic baseline survey.	case of acquisition of private land, Section-4 notification will be used as cut-of date
Involuntary LAR	LAA governs land acquisition and land is acquired strictly in accordance with LAA procedures.	Eminent domain is recognized and subject to social safeguard provisions	ADB SPS principles related to involuntary resettlement, including those occupying the ROW will be applied.
Negotiated LAR	Included as one of the options for acquiring land. In practice, agencies are reluctant to use this option for fear of being questioned later or suspected of conniving with landowners.	Negotiated land acquisition is encouraged and subject to social safeguard provisions.	Not applicable to KP-RRDP
Eligible DPs	Only titled persons or those with recognizable claim to the affected land	All physically and economically displaced persons, including titled and non-titled, with differential entitlements	All DPs, including those who don't have right to land (i.e. those occupying the ROW) will be entitled to compensation for non-land assets and provided with rehabilitation assistance
compensation to all eligible persons with or without titles.	Compensation paid to only the titleholders and those with legally recognizable claims.	Lack of title should not be a bar to compensation. Requires equal treatment of those without clear land titles (for example squatters, or other informal settlers) in terms of their entitlements for resettlement assistance and compensation for the loss of non-land assets. Titled and non-titled with legally recognizable claims to land: land for land of equivalent value and quality or cash compensation at replacement value.	All DPs, including those without title to land (i.e. those occupying the ROW) will be eligible to compensation for non-land assets.
Compensation of structures	The valuation of structures is based on official rates with depreciation deducted from gross value of the structure and also 15% of the value of salvage materials.	Replacement of structures or cash compensation at replacement value for all DPs, titled and non-titled.	Compensation of structures (regardless of DPs' tenure on land) will be provided at replacement cost.
Community and public resources	Damages done to land and structures are to be paid	Restoration/provision of civic infrastructure and community services	All affected infrastructure and community services will be restored.


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IR Policy	Pakistan's Land Acquisition Act of 1894	ADB IR Safeguards-SPS 2009	Gap Filling Measure in the KP-RRDP
Replacement cost	Land valuation based on the median registered land transfer rate over the 3 years prior to Section 4 of LAA being invoked. Calculation of compensation considers factors as per Section 23 (i.e. i) its market value of land, ii) loss of standing crops, trees and structures, iii) any damage sustained at the time of possession, iv) injurious affect to other property (moveable or immoveable) or his earnings, v) expenses incidental to compelled relocation of the residence or business and vi diminution of the profits between the time of publication of Section 6. A 15% compulsory land acquisition charge is paid over and above the assessed compensation.	Full replacement cost includes fair market value, transaction costs, interest accrued, transitional and restoration costs and other applicable payments without depreciation. Land valuation to be done by qualified and experienced experts.	All compensation payments will be assessed based on replacement cost principle.
Income restoration and livelihood support	Only compensation is paid but not resettlement allowances and/or any income restoration support. There is no mechanism to ensure payment is made before displacement.	Enhance, at least restore, DPs' livelihoods. Compensation of lost incomes and livelihood sources at full replacement cost; credit, training, and employment assistance; project development benefits.	DPs whose livelihoods are affected will be supported to restore/improve their livelihood.
Women and Vulnerable persons	No provision in LAA	Improve livelihoods to at least national minimum standards. Due consideration of women in census and surveys, consultation, grievance redress, as well as compensation and rehabilitation	Special attention/additional support will be provided to women and vulnerable groups to help them cope with their displacement.
Relocation assistance	No provision in LAA	Secure tenure, better housing, transitional support, infrastructure, and services	Transitional and other required support will be included in the entitlement of DPs.
Timing and notification of displacement	Provides several notifications from the issuance of Section IV until land award. Under normal process, compensation	No physical or economic displacement before compensation has been paid, other entitlements have been provided and	Compensation will be provided before displacement. This will be monitored and reported before works


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IR Policy	Pakistan's Land Acquisition Act of 1894	ADB IR Safeguards-SPS 2009	Gap Filling Measure in the KP-RRDP
	should be made available prior to taking possession of site. However, receipt of compensation by the DPs is not required prior to taking possession of land. Moreover, under the LAA's urgency clause, taking possession of site can be allowed after depositing the estimated amount of compensation at the district treasury after 15 days from publication of the notice mentioned in sub-section (1) of Section 9 of the LAA even if DPs have not received or object to the compensation amount.	income and livelihood program is in place	will be allowed to commence in areas with LAR impacts.
Monitoring and evaluation	No requirement	Monitoring and assessment of IR outcomes; disclosure of monitoring reports	Semi-annual monitoring of IR related issues and actions will be conducted throughout the project implementation.

E. Remedial Measures to Bridge the Gaps

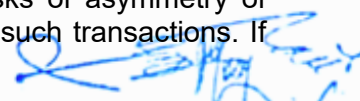
17. To establish a land acquisition and resettlement policy framework for the Project, which reconciles Pakistan's legal and regulatory system for LAR (LAA 1894) and ADB's IR Safeguards as per SPS 2009, and addresses the gaps between the two systems, the following principles (as mentioned under the project LAR policy below) will be adopted. The following "Project LAR Policy" encompassing all the gap filling measures will be adopted for a project.

F. Project LAR policy

- (i) A LARP/CAP will be prepared for the subproject to address any LAR impacts that arise during construction under the KP-RRDP project. There is a consistent risk of LAR impacts when utilizing the available ROW or current blacktop carriageway, especially in densely populated areas. This is particularly relevant where the design was compromised along an area of 3766.9 meters across 84 sections of 28 roads.
- (ii) The Project will avoid, minimize, or mitigate involuntary LAR impacts causing physical and/or economic displacement.
- (iii) Displaced persons and other stakeholders will be consulted and informed as well as given an opportunity to participate in LAR planning in a form accessible and understandable to them.
- (iv) Each draft, final or updated LARP will be submitted to ADB for review/approval, endorsed by the borrower/client and disclosed on the ADB website.


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- (v) A grievance redress mechanism with representation of all stakeholders will be established at the time of project inception.
- (vi) A comprehensive assessment of social impacts, involving (i) a census of all displaced persons, and an inventory of their lost assets (ii) a socio-economic survey of a sample of at least 10 percent of displaced persons, and (iii) a detailed measurement survey and valuation of all lost assets as well as an assessment of lost incomes will be carried out.
- (vii) An eligibility cut-off date will be declared and formalized on the date of completion of social impacts assessment survey and census of DPs.
- (viii) DPs will be compensated as per the provisions of LAA and SPS. DPs whose structures/improvements have encroached into the existing ROW will be compensated at replacement cost for their structures and improvements. All DPs will be entitled to rehabilitation assistance. LARP/s will be prepared as per the provision of approved LARF to ensure replacement cost is awarded as compensation to the DPs.
- (ix) To avoid any form of encroachment, PIU will make communication with local communities both before the contract is awarded and prior to the commencement of civil work. The project is under execution and locals are urged not to engage in any new forms of encroachment. These matters will subsequently be deliberated upon in the GRCs once formally notified.
- (x) In case of unanticipated impacts, LARP/CAP will be prepared and fully implemented in the form of complete compensation payment to DPs. A 30 days' notice will be served to DPs for vacating their assets after receiving their compensation payments.
- (xi) Compensation of land and non-land assets will be done at full replacement value, either through the replacement of land or assets of equivalent or higher value and quality or through cash compensation at replacement cost. Full replacement cost involves fair market value, transaction costs, interest accrued, transitional and restoration costs and other applicable payments without depreciation. For replacement of land or non-land assets all transaction costs will be paid by the project or included in compensation payments to the DPs. The value of structures will not be depreciated for age.
- (xii) Qualified valuation experts will be engaged to assess the value of lost assets according to legally sanctioned principles of Pakistan's LAA and the ADB IR safeguard norm of replacement cost and value as stipulated in LAR policy principle 10.
- (xiii) Incomes and livelihood sources lost, including but not restricted to crops and trees or interruption of business activities and employment, will be fully compensated at replacement cost. DPs permanently losing incomes and livelihood sources as well as poor and vulnerable DPs are entitled to credit, training, and employment assistance to maintain or improve their livelihoods.
- (xiv) DPs will not be physically or economically displaced before compensation has been paid, other entitlements have been provided and an income and livelihood program is in place.
- (xv) Where feasible, the project will adopt negotiated purchase of land as the first preferred option for land acquisition. Negotiated settlement based on meaningful consultation with affected persons, including those without legal title to assets is encouraged in the SPS. A negotiated settlement will offer an adequate and fair price for land and/or other assets. The borrower/client will ensure that any negotiations with displaced persons openly address the risks of asymmetry of information and bargaining power of the parties involved in such transactions. If


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the landowners refuse to sell their land, a nearby alternative plot will be explored for which negotiation will be undertaken. If no alternative feasible site is available and negotiations fail with the required plot, LARP/s will be prepared as per the provisions of this LARF to compensate for the losses.

G. Special Provisions for Displaced Vulnerable Persons

18. To identify vulnerable persons and their households, the following vulnerability indicators were established. Vulnerable households exhibit one or a combination of the following conditions:

- (i) Monthly per capita income is equal to or less than poverty line or less.
- (ii) Female headed household without children/members contributing income to the household.
- (iii) Elderly head of household without children/members contributing income to the household.
- (iv) Disabled persons of household with/without children/others are contributing income.
- (v) Vulnerable households and the specific LAR impacts on their livelihood will be identified in the census and socio-economic survey for each project and indicated in each LARP. The displaced vulnerable persons will be consulted and measures for the rehabilitation and enhancement of their livelihood will be provided to safeguard against impoverishment and to reduce their vulnerability.

H. Special Provisions for Displaced Women

19. To ensure a clear understanding and due consideration of specific LAR impacts on displaced women and to safeguard their livelihoods, specific provisions for women will be adopted for the LAR process, including (i) enumeration of all women and, if applicable, of their status as heads of household or otherwise vulnerable persons; (ii) collection of gender disaggregated socio-economic data; (iii) consultation of women in joint or separate meetings; (iv) due consideration of grievances lodged by women; and (v) provision of compensation and/or new titles to women if they are titled or recognized owners of lost assets, and provisions of rehabilitation measures to women, if households are female headed or women's livelihood is directly concerned. The LARP for projects will detail the scope of LAR impact on women and where required gender action plans will be prepared, implemented, and monitored within or outside LARP. The details of entitled compensation and any additional plans will also be disclosed in a culturally appropriate way to ensure awareness.



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V. ELIGIBILITY AND ENTITLEMENTS

20. Since the LAR Legal and Policy Framework, the following eligibility and entitlements are recognized and applicable in land acquisition and resettlement in all of its project with LAR impacts. The entitlement matrix in Table 5-1 summarizes the provisions for eligibility and entitlements under this LARF.

A. Eligibility

21. Eligible for compensation, relocation, and livelihood rehabilitation entitlements under this LARF are persons who were located and used land in the project area prior to the cut-off date and who are physically and/or economically displaced due to permanent or temporary loss of land, structures and/or livelihood, whether full or partial, as a consequence of land acquisition. Such eligible DPs include the following:

- (i) Owners of land and/or structures, including those recognized as legally titled or legalizable on the basis of claims recognizable under national law.
- (ii) Lessees (leaseholders) of state or private land, whether long-term or short-term.
- (iii) Sharecrop tenants with or without formal legal registration according to national law.
- (iv) Non-titled occupants of land, such as squatters or encroachers.
- (v) Business owners, whether registered under national law or informal.
- (vi) Employees of private or public businesses or enterprises, whether registered under national law or informal.
- (vii) Cultivators of crops and/or trees, irrespective of legal status of property relation to land;
- (viii) Vulnerable persons, including households headed by women, elderly and/or disabled persons, the households in local context with per capita incomes at or below the poverty line.
- (ix) DPs who neither have formal legal rights nor recognizable claims to lands will be entitled to be compensation for their non-land assets. The eligibility also includes those who are temporarily/permanently or partially/fully affected by the project with formal and informal dependence on land and/or non land assets for income generation and livelihoods.

B. Cut-off date

22. Eligibility for entitlements under this LARF is limited by a cut-off date, determined at the time of social impacts assessment (SIA) survey, census of displaced persons (DPs), inventory of losses (IOL) and socioeconomic baseline survey. If land acquisition is involved, the cut of date for land under LAA 1894 is the date when Section 4 of LAA is issued. Once Section 4 has been issued, buying and selling of land in the notified area comes to a stop till land is acquired. However, due to the lengthy process of land acquisition and timeline between different sections of LAA (Section 4 notification up to land award) the date of social impact assessment and census of DPs is usually considered as the cut-off-date. Any person moving into the land located within the alignment of the project after this cut-off date will not be eligible for compensation, relocation, and livelihood rehabilitation entitlements The EA will establish the cut-off date which will be disclosed to the DPs through consultative meetings, focus group discussions (FGDs) and field surveys, and formalized through documentation and disclosure of reports.



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C. Entitlements

23. Full replacement cost as compensation is the basic principle guiding the allocation of entitlements, i.e. the project will replace in kind or cash what is lost in terms of land, structures, livelihood, community facilities and services, with special provisions for the improvement of livelihoods of vulnerable displaced persons, sharing of project benefit and unanticipated impacts. The entitlements and the entitlement matrix for a project RP will be specific to the types of impacts, losses and eligible persons occurring in a project, while the provisions made in this LARF include a wider range of the possible cases which may arise under the project. Each individual DP will be eligible for a combination of entitlements specific to his/her particular losses and property relations to the lost assets. The entitlements are given below.

D. Land and Non-Land Assets

1.1.1 Agricultural land

24. **Agriculture land** (partially or fully affected) will be compensated at full replacement costs including fair market value, all transaction costs, such as applicable fees and taxes and other applicable payments. Qualified and experienced land valuation expert will determine the replacement cost. If the compensation determined by the Board of Revenue (BOR) is found to be less than full replacement cost, PIU will pay the price differential to the DPs. For DPs losing more than 10% or more of their productive resources, severe impact allowance equal to market value of the gross annual yield of lost land for one year will also be paid. Land for land compensation through the provision of a fully titled and registered replacement plot of comparable value, quantity and quality as the lost plot will also be explored if viable. Non-titled users of agricultural land, i.e. those without traditional rights/squatters losing informal use of agricultural land, will be provided with an income rehabilitation allowance in cash equal to the net market value of yearly harvest income based on relevant cropping pattern and cultivation record (additional to standard crop compensation), and compensation for any irrigation infrastructure and other improvements made to the land (but not for the land) at full replacement cost; and other appropriate rehabilitation to be defined in the RPs based on project situation and DP consultation.

25. Leaseholders **or tenants on government land** will be entitled to either renewal of the lease in other plots or cash compensation equivalent to the market value of net yield of the affected land for the remaining lease years (additional to standard crop compensation), up to a maximum of three (03) years.

26. **Sharecroppers** will share the crop compensation with the landowner based on the proportions stipulated in the sharecropping contract. Compensation in cash will be equivalent to the market value of the gross yield of lost harvest according to crop compensation (if impact is temporary); plus one (01) additional crop compensation (if the land is lost permanently).

27. **Agricultural laborers**, with contracts to be interrupted, will be provided with compensation equal to their salary/daily wage or minimum wage/official poverty line (OPL) whichever higher for the remaining agreement/contract period. In case there is no contract, opportunity cost will be calculated for the loss of work opportunity up to a maximum period of three months.

1.1.2 Residential, commercial, public and community land:



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28. **For partial loss** of a plot/percent of the total plot (considering functional viability of remaining plot), owners -defined as titleholders or legalizable users- will receive cash compensation at replacement cost according to the quantity and quality of the land lost, including all transaction costs. Lessees or rental tenants will receive a cash refund at the rate of the rental fee proportionate to the size of the affected plot and the duration of the remaining lease period. Non-titled land users, squatters or encroachers on affected land will not receive compensation for the partial loss of land but will be provided with access to land through a rent to own arrangement as under the entitlements for agricultural land.

29. **For full loss** of a plot/percent of the total owned plot (taking into account functional viability of remaining plot), owners may choose between either (i) land for land compensation through the provision of a fully titled and registered replacement plot of comparable value, quantity and quality as the lost plot at a relocation site for the displaced community or another location agreeable to the DP or (ii) cash compensation at replacement cost according to the quantity and quality of the land lost. In either case all transaction costs, such as applicable fees and taxes, will be borne by the EA. Lessees or rental tenants will receive a cash refund at the rate of the rental fee for the duration of the remaining lease period for the entire lost plot. Non-titled land users squatters or encroachers on affected land will not receive compensation for the loss of land, but will be provided with access to land through a rent to own arrangement as above.

1.1.3 Temporary occupation of land

30. Temporary occupation of land is required in the short term for construction and other uses during civil works. Such owners, lessees and tenants will receive a rental fee commensurate with current local land rents for the period of occupation of the land. All DPs so affected will have guaranteed access to their land and structures located on their remaining land and their land will be restored to its original state.

E. Structures

31. For the partial loss of structure/percent of the total of a residential, agricultural, commercial, public and community structure or its alteration (taking into account of functional/economic viability of remaining or un-affected part of the structure), the owners, including non-titled land users, will receive cash compensation for the lost parts of a structure at replacement cost and for the repair of the remaining structure at the market rate for materials, labor, transport and other incidental costs, without deduction of depreciation for the age of the structure. They have the right to salvage all usable materials from the lost structures. Lessees and rental tenants receive a cash refund at the rate of the rental fee proportionate to the size of the lost part of the structure and the duration of the remaining lease period.

32. For the full loss of a residential, agricultural, commercial, public and community structure/percent of the total structure (taking into account functional/economic viability of remaining structure), the owners, including non-titled land users, may choose between either (i) the provision of a fully titled and registered replacement structure of comparable value, quantity and quality, including payment for all transaction costs (such as applicable fees and taxes), at a relocation site or another location agreeable to the DP, or (ii) cash compensation at replacement cost, including all transaction costs (such as applicable fees and taxes), without deduction of depreciation for age, for self-relocation. If the market value of a replacement structure is below that of the lost structure, the owner will be paid cash compensation for the difference in value without deduction of depreciation for age. If the market value of the replacement structure is above


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that of the lost structure, no further deductions will be made. In either case the owners have the right to salvage all usable materials from the lost structures.

33. If minor structures, such as fences, sheds or latrines, need to be moved, their owners or the lessees and tenants, depending on the arrangements between owners and tenants, may either (i) receive cash compensation for self-relocation of the structure at the current market rate for the cost of labor, materials, transport and other incidental costs, as required, without deduction of depreciation for age, or (ii) the structure may be relocated by the Project.

34. For stalls and kiosks of street vendors, whether titled or licensed or not, alternative sites comparable in business potential to the lost location will be provided and the vendors will receive cash compensation for self-relocation of their stalls at the current market rate for the cost of labor, materials, transport and other incidental costs, as required, without deduction of depreciation for age.

F. Crops

35. Cultivators of affected crops will be paid cash compensation for the loss of a crop at the current market rate proportionate to the size of the lost plot, based on the crop type and the highest average yield from among the past 3 years from the date of assessment. The parties to a share cropping arrangement will distribute this compensation between the landowner and the tenant according to the legally stipulated or the traditionally or informally agreed share.

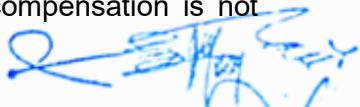
G. Trees

36. Cultivators of affected trees will receive cash compensation for perennial tree crops at the current market rate of the crop type and average yield (i) multiplied, for immature non-bearing trees, by the years required to grow such a tree back to productivity or (ii) multiplied, for mature crop bearing trees, by the average years of crops forgone. In addition, the cost of purchase of seedlings and required inputs to replace these trees will be paid. For timber trees, cash compensation will be paid at the current market rate of the timber value of the species at current volume, in addition to the cost of purchase of seedlings and required inputs to replace the trees. The rates and valuation methods will be determined using the accepted methodology in use at the Departments of Agriculture and Forestry.

H. Resettlement & Relocation

1.1.4 Land for land compensation.

37. Land for land compensation has significant advantages in that it reduces the chance of displaced people spending their compensation on items that will not provide them with an alternative economic livelihood. Therefore, preference will be given to land-based resettlement strategies for displaced persons whose livelihoods are land-based. These strategies may include resettlement on public land, or on private land acquired or purchased for resettlement. Whenever replacement land is offered, displaced persons are provided with land for which a combination of productive potential, locational advantages, and other factors is at least equivalent to the advantages of the land taken. If land is not the preferred option of the displaced persons, or sufficient land is not available at a reasonable price, non-land-based options built around opportunities for employment or self-employment should be provided in addition to cash compensation for land and other assets lost. In case the land for land compensation is not


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possible, the lack of availability of land will be demonstrated and documented to the satisfaction of ADB.

1.1.5 Relocation assistance

38. Where applicable, the DPs will be provided logistical support for the identification and purchase or rental of replacement plots and/or structures, or the construction of new structures as well as with all related administrative tasks. The physically displaced persons will be relocated at a relocation site or will self-relocate at individual sites and structures of their own choice.

1.1.6 Security of tenure

39. Arrangements for secure tenure to the replacement land and structures will be made and their provision to each DP, according to the level of eligibility of each DP, will be ensured.

1.1.7 Transport allowance

40. All DPs to be relocated due to loss of land and/or structures including residences, business premises or agricultural land, are entitled to receive a cash allowance to cover the cost of transport of people and their movable property (furniture, household items, personal effects, machinery, tools etc.) and of setting up at the new premises at the current market rate for labor, vehicle hire, fuel and incidental costs. A lump sum amount of compensation (covering all items mentioned) will be provided to the DPs.

1.1.8 Transition allowances

41. To facilitate moving and settling process, a transition allowance of 3 months of the official minimum wage/OPL (whichever is greater) is paid in addition to any income loss compensation, as applicable. If relocation sites with completed housing and full facilities are not available in time, the DPs will be provided with transition arrangements, either in the form of adequate transition housing of a standard comparable to the lost housing, or with a rental allowance permitting the rental of housing at such a standard and covering the entire transition period.

I. Income Restoration

1.1.9 Loss of agriculture-based livelihood

42. In case of a partial loss of agricultural land without available replacement land, but remaining viable land, in addition to cash compensation for the loss of land as indicated above, the displaced owner, lessee, sharecrop tenant or non-titled user of land will be provided with financial support for investments in productivity enhancing inputs, including but not limited to land leveling, terracing, biological, erosion control, sprinkler/drip irrigation, composting, tools and agricultural extension, as feasible and applicable. Additional financial support in the form of grants and micro-credit will be available, if the compensation for partial land loss is insufficient to allow for adequate investments to maintain the DP's livelihood.

43. For the full loss of viable agricultural land without availability of alternative land, in addition to cash compensation for the loss of land as indicated above, the displaced owner, lessee, sharecrop tenant or non-titled user of land will be provided with re-training, job placement, additional financial support in the form of grants and micro-credit for investments in equipment



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and buildings, as well as with organizational and logistical support to establish the DP in an alternative income generation activity. If possible, Project EA will coordinate and/or cooperate with governmental and non-governmental income generation and micro-enterprise development initiatives.

1.1.10 Maintenance of access to means of livelihood

44. The Project EA will ensure that the agricultural fields, business premises and residences of persons in the project area remain accessible, by either avoiding the obstruction of such access or by including special provisions for access in the technical design of project facilities. The project LARP will elaborate on specific anticipated impacts and outline measures to ensure access.

1.1.11 Businesses

45. For the temporary loss of business income due to LAR or construction activities by the project, the owner of a business will receive cash compensation equal to the lost income during the period of business interruption, based on tax records or, in their absence, comparable rates from registered businesses of the same type with tax records. However, if tax based lost incomes are unknown, then official poverty line (inflation adjusted) will become the minimum rate of compensation per family per month.

46. For permanent loss of business due to LAR without the possibility of establishing an alternative business or re-establishing the lost business at a new location, the owner will be compensated with (i) cash compensation equal to the lost income for 12 months or as agreed and will be determined by the business on a case-by-case basis, depending on the monthly income generated by the business. Cash compensation will be based on tax records or, in their absence, comparable rates from registered business of the same type with tax records. If tax based lost incomes are unknown, then official poverty line (inflation adjusted) will become the minimum rate of compensation per family per month, and (ii) provision of re-training, job-placement, additional financial support in the form of grants and micro-credit for investments in equipment and buildings, as well as organizational and logistical support to establish the DP in an alternative income generation activity. Coordination with relevant governmental and non-governmental programs will be sought.

1.1.12 Employment

47. The temporary loss of employment due to LAR or construction activities among all laid-off employees of affected businesses will be compensated through cash compensation equal to the lost wages during the period of employment interruption, based on tax records or registered wages, or, in their absence, comparable rates for employment of the same type. As may be required under Pakistan's labor laws and regulations/codes, the compensation for lost income from employment will be paid to the employer to enable him/her to fulfill applicable legal obligations to provide compensation payments to laid-off employees. An arrangement of payment disbursement between employer and laid-off employees would need to be documented, verified and made part of the RP. If, however, tax based lost incomes are unknown, then official poverty line (inflation adjusted) will become the minimum rate of compensation per family per month. The prompt and full payment of compensation to the employees is to be verified by an authorized official by EA.



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48. For the permanent loss of employment due to LAR with the possibility of re-employment in a similar sector and position in or near the area of lost employment, the laid-off employees will be (i) paid cash compensation equal to the lost wages for 12 months, based on tax records or registered wages, or, in their absence, comparable rates for employment of the same type, as may be required by Pakistan Labor Laws and regulations/codes. The compensation for lost income from employment will be paid to the employer to enable him/her to fulfill applicable legal obligations to provide compensation payments to laid-off employees. An arrangement of payment disbursement between employer and laid-off employees would need to be documented, verified and made part of the RP. If, however, tax based lost incomes are unknown, then official poverty line (inflation adjusted) will become the minimum rate of compensation per family per month. All possibilities will be explored to provide training, job-placement, additional financial support (if required) in the form of grants and micro-credit for investments in equipment and buildings, as well as organizational and logistical support to establish the DP in an alternative income generation activity. Coordination and cooperation with relevant governmental and nongovernmental programs. The prompt and full payment of compensation to the employees is to be verified by an authorized official by EA and Resettlement Specialist of PMSCS.

B. Public services and facilities


49. Public services and facilities interrupted and/or displaced due to LAR will be fully restored and re-established at their original location or a relocation site. All compensation, relocation and rehabilitation provisions of this LARF are applicable to public services and facilities. These include but are not limited to schools, health centers, community centers, local government administration, water supply or graveyards.

J. Special provisions

1.2.1 Vulnerable DPs

50. All DPs who are losing livelihood are entitled to livelihood restoration/improvement support in the form of cash and/or training, job-placement, additional financial support in the form of grants and micro-credit for investments in business or re-employment related equipment and buildings, as well as organizational and logistical support to establish the DP in an alternative income generation activity. Training and support in a viable and suitable income generation activity selected by the DP is eligible for support, including in agriculture, manufacturing or services. For vulnerable DPs, to facilitate the process of training and establishment of a new income generation activity, a subsistence allowance of 3-6 months of the official minimum wage/OPL (whichever is greater) is paid in addition to any income loss compensation and transition allowance, as applicable. Coordination and cooperation with relevant governmental and non-governmental programs will be sought. Moreover, all vulnerable DPs receive preferential consideration in the selection of project related employment, including civil works, as well as the operation and maintenance of the facilities constructed under the project. This provision will be reflected in the civil works contracts as well as the agreements between the project executing agency and the ADB.

51. All vulnerable DPs affected by the loss of land will be assisted with the identification and purchase or rental of a new plot and/or structure, as the case may be, as well as the administrative process of land transfer, including cadastral mapping and registration of their property titles. Assistance will also be provided with the preparation of compensation, relocation and rehabilitation agreements with the executing agency or authorized government agency.


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52. All vulnerable DPs affected by the loss of a structure will be assisted with the construction of a new structure or the identification and purchase or rental of a new structure. Further assistance will be given with the administrative process of registration of the new property, with the transition to the relocation site and with the preparation of compensation, relocation and rehabilitation agreements with the executing agency or authorized government.

53. Temporary occupation of land at properties owned or occupied by vulnerable persons will be avoided and, if unavoidable, preferentially mitigated. Civil work at these sites will be completed as quickly as possible. For disabled and elderly persons suitable access to their land and residences will be ensured.

1.2.2 Legal and Administrative issues

54. Considering the guidance note, the EA will have to take appropriate actions to demonstrate that sufficient good-faith efforts have been made toward addressing the legal and administrative impediments to payments.

1.2.3 Women

55. Women DPs who are the titled or recognized owners of land and structures or whose livelihoods are directly affected will receive compensation and titles for replacement land and structures, as well as other entitlements, in their name. Any monetary compensation due to women will be disbursed to them directly.

1.2.4 Update on Eligibility and Entitlements

56. For unanticipated impacts identified during project implementation and not covered under the eligibility and entitlement provisions of this LARF, new and additional eligibility and entitlement provisions will be determined in accordance with the IR safeguards requirements of ADB's SPS and the applicable legal framework of Pakistan.

57. The standards agreed and established for the eligibility and entitlement provisions of this LARF shall be maintained and may be raised, but not lowered in any project section RP.

Table 5-1: Entitlement Matrix

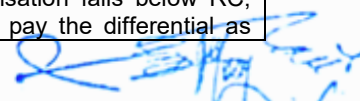
Type of Loss	Specification	Eligibility	Entitlements
1. Land			
Permanent impact on arable land	All land losses independently from impact severity	Owner (titleholder, or holder of traditional rights)	<ul style="list-style-type: none"> Land for land compensation with comparable productivity and suitability to be explored (if feasible) OR Cash compensation at full replacement cost (RC¹) including fair market value plus 15% compulsory acquisition surcharge all transaction costs, applicable fees and taxes and any other payment applicable. If BoR² compensation falls below RC, the project will pay the differential as

¹ Refer to IR safeguards as in SR2 para 10 of SPS 2009

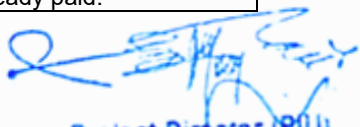
² Board of Revenue, provincial agency with a mandate to approve compensation rate/amount


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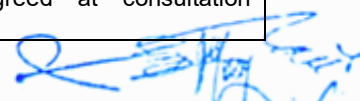
Type of Loss	Specification	Eligibility	Entitlements
			<p>resettlement assistance to the DPs to restore affected livelihoods.</p> <ul style="list-style-type: none"> • Additional compensation to be worked out in consultation with DPs if the loss is 10% or more of productive resources including land.
		Leaseholder titled/untitled	<ul style="list-style-type: none"> • Compensation commensurate to lease type and duration to be defined in the RP • Production based on relevant cropping pattern/cultivation record (additional to standard crop compensation as defined below) and other appropriate rehabilitation, to be defined in the RPs based on project situation and AP consultation.
		Sharecropper/ tenant (titled/untitled)	<ul style="list-style-type: none"> • Cash compensation equal to gross market value of crop compensation (see below) to be shared with the landowner based on the sharecropping • Income rehabilitation allowance in cash equal to net value of annual crop production based on relevant cropping pattern/cultivation record (additional to standard crop compensation and other appropriate rehabilitation to be defined in the RPs based on project situation and DP consultation).
		Squatter, encroacher.	<ul style="list-style-type: none"> • No compensation for land loss • In addition to standard crop compensation, income rehabilitation allowance in cash equal to net value of annual crop production and other appropriate rehabilitation to be defined in the LARPs based on project specific situation and DP consultation. • Compensation for any irrigation infrastructure and other improvements made to the land (but not for the land) at full replacement cost.
Severe impact on productive land	Loss of 10% of productive (income earning) land	Titleholder, or holder of traditional rights	<ul style="list-style-type: none"> • Cash compensation for 3 months equal to national minimum wage i.e. PKR 30,000/month as fixed by the Federal Government for the year 2023-24. The amount for three months will be equal to PKR 30,000 X 3 = 90,000
Residential/ commercial land	All land losses	Titleholder, or holder of traditional rights Lessee, tenant Renter/ leaseholder Non-titled user without traditional rights (squatters)	<ul style="list-style-type: none"> • Cash compensation at full replacement cost (RC) including fair market value plus 15% compulsory acquisition surcharge all transaction costs, applicable fees and taxes and any other payment applicable. • If BoR compensation falls below RC, the project will pay the differential as


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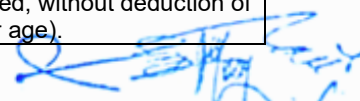
Type of Loss	Specification	Eligibility	Entitlements
			<p>resettlement assistance to the DPs to restore affected livelihoods.</p> <ul style="list-style-type: none"> • Additional compensation to be worked out in consultation with DPs if the loss is 10% or more of productive resources including land. • Cash refund/payment at the rate of lease or house rent for remaining lease period or house rent. • Rent allowance in cash equivalent to 3-6 months' rent to be decided in consultation meetings with DPs. • No compensation for land loss • Self-relocation allowance in cash equivalent to 3 months livelihood based on OPL, or as assessed based on income analysis.
Temporary land occupation	Land temporarily required during civil works	Owner, lessee, tenant	<ul style="list-style-type: none"> • Lease agreements to be signed between the DPs and the contractor for the period of occupation of land. Rental fee payment for period of occupation of land, as mutually agreed by the parties. • Restoration of land to original state • Guarantee of access to land and structures located on remaining land.
		Non-titled user	<ul style="list-style-type: none"> • Restoration of land to original state • Guarantee of access to land and structures located on remaining land.
2. STRUCTURES			
Residential, agricultural, commercial, public, community	Partial Loss of structure	Owner (including non-titled land user)	<ul style="list-style-type: none"> • Cash compensation for affected structure (full or partial considering functioning viability of remaining portion of partially affected structure) at full replacement cost and repair of remaining structure at market rate for materials, labor, transport and other incidental costs, without deduction of depreciation. • Right to salvage materials (without deduction) from lost structure. • For vulnerable households, provide legal and affordable access to adequate housing to improve their living standard to at least national minimum standard. • Any improvements made to a structure by a tenant will also be considered in the calculation of compensation at full replacement cost payable to the owner and any apportionment due to the tenant as agreed at consultation meetings.
		Lessee, tenant	<ul style="list-style-type: none"> • Cash refund at rate of rental fee proportionate to size of lost part of structure and duration of remaining lease period already paid.


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Type of Loss	Specification	Eligibility	Entitlements
	Full loss of structure and relocation.	Owner (including nontitled land user)	<ul style="list-style-type: none"> • Any improvements made to a structure by a tenant will also be considered in the calculation of compensation at full replacement cost payable to the owner and any apportionment due to the tenant as agreed at consultation meetings. • The DP may choose between the following alternatives: <ul style="list-style-type: none"> • Compensation through provision of fully titled and registered replacement structure of comparable quality and value, including payment of all transaction costs, such as applicable fees and taxes, at a relocation site or a location agreeable to the DP. • Any improvements made to a structure by a tenant will also be considered in the calculation of compensation at full replacement cost payable to the owner and any apportionment due to the tenant as agreed at consultation meetings. • If the market value of the replacement structure is below that of the lost structure, cash compensation for the difference in value without deduction of depreciation. • If the market value of the replacement structure is above that of the lost structure, no further deductions. or • Cash compensation at full replacement cost, including all transaction costs, such as applicable fees and taxes, without deduction of depreciation for age, for self-relocation. In any case, DP has the right to salvage the affected structure. • Severity assistance to all losing structures permanently equivalent to 3 months equal to national minimum wage i.e. PKR 30,000/month as fixed by the Federal Government for the year 2023-24. The amount for three months will be equal to PKR 30,000 X 3 = 90,000.
		Lessee, tenant	<ul style="list-style-type: none"> • Cash refund at rate of rental fee proportionate to duration of remaining lease period. • Any improvements made to a structure by a tenant will also be considered in the calculation of compensation at full replacement cost payable to the owner and any apportionment due to the tenant as agreed at consultation meetings.


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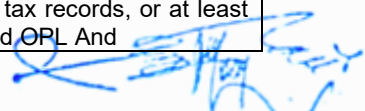
Type of Loss	Specification	Eligibility	Entitlements
	Full loss of structure and relocation.	Owner (including nontitled land user)	<ul style="list-style-type: none"> The DP may choose between the following alternatives: Compensation through provision of fully titled and registered replacement structure of comparable quality and value, including payment of all transaction costs, such as applicable fees and taxes, at a relocation site or a location agreeable to the DP. Any improvements made to a structure by a tenant will also be considered in the calculation of compensation at full replacement cost payable to the owner and any apportionment due to the tenant as agreed at consultation meetings. If the market value of the replacement structure is below that of the lost structure, cash compensation for the difference in value without deduction of depreciation. If the market value of the replacement structure is above that of the lost structure, no further deductions. or Cash compensation at full replacement cost, including all transaction costs, such as applicable fees and taxes, without deduction of depreciation for age, for self-relocation. In any case, DP has the right to salvage the affected structure. Severity assistance to all losing structures permanently equivalent to 3 months equal to national minimum wage i.e. PKR 30,000/month as fixed by the Federal Government for the year 2021-22. The amount for three months will be equal to PKR 30,000 X 3 = 90,000
		Lessee, tenant	<ul style="list-style-type: none"> Cash refund at rate of rental fee proportionate to duration of remaining lease period.
	Moving of minor structures (fences, sheds, latrines etc.)	Owner, lessee, tenant	<p>The DP may choose between the following alternatives:</p> <ul style="list-style-type: none"> Cash compensation for self-relocation of structure at market rate (labor, materials, transport and other incidental costs, as required, without deduction of depreciation for age) Or Relocation of the structure by the Project.
	Stalls, kiosks	Vendors (including titled and non-titled land users)	<ul style="list-style-type: none"> Allocation of alternative location comparable to lost location, and Cash compensation for self-relocation of stall/kiosk at market rate (labor, materials, transport and other incidental costs, as required, without deduction of depreciation for age).


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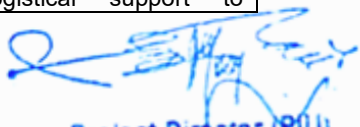
Type of Loss	Specification	Eligibility	Entitlements
3. Crops			
	Affected crops	Cultivator	<ul style="list-style-type: none"> • Cash compensation at current market rate proportionate to size of lost plot, based on crop type and highest average yield over past 3 years. • Additional compensation to be worked out in consultation with DPs if the loss is 10% or more of productive resources including land.
		Parties to sharecrop arrangement.	<ul style="list-style-type: none"> • Same as above and distributed between landowner and tenant according to legally stipulated or traditionally/informally agreed share.
4. Trees			
	Affected Trees	Cultivator	<ul style="list-style-type: none"> • Cash compensation for perennial crop trees at current market rate of crop type and average yield (i) multiplied, for immature non-bearing trees, by the years required to grow tree to productivity or (ii) multiplied, for mature crop bearing trees, by the average years of crops forgone; plus, cost of purchase of seedlings and required inputs to replace trees. • Cash compensation for timber trees at current market rate of timber value of species at current volume, plus • Cost of purchase of seedlings and required inputs to replace trees.
		Parties to sharecrop arrangement	<ul style="list-style-type: none"> • Same as above and distributed between landowner and tenant according to legally stipulated or traditionally/informally agreed share.
5. RESETTLEMENT & RELOCATION			
Relocation Assistance	All types of structures affected	All DPs titled/untitled requiring to relocate as a result of losing land and structures	<ul style="list-style-type: none"> • The project will provide logistic support to all eligible DPs in relocation of affected structures whether project-based relocation or self-relocation as opted by the DPs. • If project-based relocation, DPs will be provided with fully functional public services and facilities including school, health center, community center, electricity, water supply and sewage and irrigation facility with their long-term operation and maintenance planned and agreed.
Security of tenure	Replacement land and structures	All DPs and tenants needing to relocate to project relocation sites.	<ul style="list-style-type: none"> • If DPs are required to relocate to project relocation sites, they will be provided with secure tenure to the replacement land and structures.
Transport allowance	All types of structures requiring relocation	All DPs and tenants required to relocate as a result of losing land and structures	<ul style="list-style-type: none"> • Compensation (in cash or kind as agreed with DPs) to all eligible DPs and tenants. • For residential structure, a lump sum amount of Rs. 15,000/ or higher


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Type of Loss	Specification	Eligibility	Entitlements
			<p>depending upon the situation on ground.</p> <ul style="list-style-type: none"> For commercial structure, a lump sum amount of Rs. 10,000/ or higher depending upon the situation on ground. For kiosk, a lump sum amount of Rs.3000/ or higher depending upon the situation on ground.
House rent	All types of structures requiring relocation	All DPs and tenants required to relocate as a result of losing land and structures	<ul style="list-style-type: none"> A lump sum amount, as agreed between the DP and project team, to assist the DPs in renting house for a negotiated period of time, for a comparable structure or apartment to the one lost.
Transition allowance	All types structures requiring relocation	All DPs and tenants required to relocate	<ul style="list-style-type: none"> On a case-to-case basis, transitional allowance equal to 3 months of recorded household income or equal to inflation adjusted official poverty line, whichever is higher.
Arable, residential and commercial land and structures	All types of structures	All DPs titled/untitled losing land & structures	<ul style="list-style-type: none"> Additional cash compensation of 15% as solatium over and above the BOR compensation price. Payment of any price differential or top-up, based on replacement cost study.
6. INCOME RESTORATION			
Permanent loss of agriculture based livelihood.	Partial loss of agricultural land with viable land remaining	Owner, lessee, sharecrop tenant, non-titled land user	<ul style="list-style-type: none"> Provision of support for investments in productivity enhancing inputs, such as land leveling, terracing, biological, erosion control, sprinkler/drip irrigation, composing, tools and agricultural extension, as feasible and applicable; additional financial support if land compensation is insufficient to allow for adequate investments to maintain livelihood.
	Full loss of viable agricultural land without availability of alternative land.	Owner, lessee, sharecrop tenant, non-titled land user.	<ul style="list-style-type: none"> Provision of re-training, job-placement, additional financial grants and micro-credit for equipment and buildings, as well as organizational/logistical support to establish DP in alternative income generation activity.
Maintenance of access to means of livelihood	Avoidance of obstruction by project facilities	All DPs	<ul style="list-style-type: none"> Provide un-interrupted access to agricultural fields, business premises and residences of persons in the project area.
Businesses	Temporary business loss due to LAR or construction activities by Project	Owner business (registered, informal)	<ul style="list-style-type: none"> Cash compensation equal to lost income during period of business interruption based on tax record or, in its absence, comparable rates from registered businesses of the same type with tax records, or at least inflation adjusted OPL.
	Permanent business loss due to LAR without possibility of establishing alternative business	Owner business (registered, informal)	<ul style="list-style-type: none"> Cash compensation equal to lost income for 12 months based on tax record or, in its absence, comparable rates from registered businesses of the same type with tax records, or at least inflation adjusted OPL And


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Type of Loss	Specification	Eligibility	Entitlements
			<ul style="list-style-type: none"> Provision of training, job-placement, additional financial grants and micro-credit for equipment and buildings, as well as organizational/logistical support to establish DP in alternative income generation activity.
Employment	Temporary employment loss due to LAR or construction activities	All affected employees of affected businesses and agricultural workers	<ul style="list-style-type: none"> Cash compensation equal to lost wages during period of employment interruption up to 3 months based on tax record or registered wage, or, in its absence, comparable rates for employment of the same type, or at least inflation adjusted OPL. If required by Pakistan's labor laws and regulations/codes, the compensation will be paid to the employer to enable him/her to fulfill legal obligations to provide compensation payments to laid-off employees, to be verified by EA/relevant government official.
	Permanent employment loss due to LAR without possibility of re-employment in similar sector and position in or near area of lost employment	All laid-off employees of affected businesses and laid-off agricultural workers from affected farms	<ul style="list-style-type: none"> Cash compensation equal to lost wages for 6 months, based on tax record or registered wage, or, in its absence, comparable rates for employment of the same type, or at least inflation adjusted OPL. If required by the applicable labor code, compensation will be paid to employer to enable him/her to fulfill legal obligations to provide severance payments to laid-off employees, to be verified by government labor inspector And Provision of training, job-placement, additional financial grants and micro-credit for equipment and buildings, as well as organizational/logistical support to establish DP in alternative income generation activity.
7. PUBLIC SERVICES AND FACILITIES			
Loss of public services and facilities	Schools, health centers, administrative services, infrastructure services, graveyards etc.	Service Provider	<ul style="list-style-type: none"> Full restoration at original site or re-establishment at relocation site of lost public services and facilities, including replacement of related land and relocation of structures according to provisions under sections 1 and 2 of this entitlement matrix.
8. SPECIAL PROVISIONS			
Vulnerable APs	Support to disproportionately affected persons	All vulnerable DPs including those below the poverty line, the landless, the elderly, women and children, and indigenous peoples.	<ul style="list-style-type: none"> Provision of training, job-placement, additional financial Cash allowance equal to 3 months of official minimum wage to all vulnerable DPs. grants and micro-credit for equipment and buildings, as well as organizational/logistical support to


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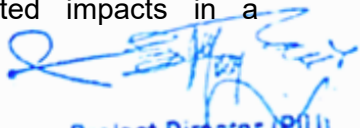
Type of Loss	Specification	Eligibility	Entitlements
			<ul style="list-style-type: none"> establish DP in alternative income generation activity. Subsistence allowance equal to 3 months of official poverty line, and other appropriate rehabilitation to be defined in the LARPs based on income analysis and consultations with DPs. Preferential selection for project related employment.
	Loss of land	All vulnerable DPs	<ul style="list-style-type: none"> Assistance in identification and purchase or rental of new plot. Assistance with administrative process of land transfer, property title, cadastral mapping and preparation of compensation agreements. Assistance in construction of new structure Assistance in identification and purchase or rental of new structure Assistance with administrative process of registration of property and preparation of compensation agreements Assistance with transition to relocation site. Preferential treatment to avoid or mitigate as quickly as possible Provision of access to land and residence suitable to disabled and elderly DPs. Provision of access to land and residence suitable to disabled and elderly DPs.
	Loss of structure	All vulnerable DPs	
	Temporary land acquisition	All vulnerable DPs	
	Loss of livelihood	Female livelihood losers directly affected	
			<ul style="list-style-type: none"> Compensation paid directly to female livelihood loser.

VI. SOCIAL IMPACT ASSESSMENT - ASSESSMENT OF LAR IMPACTS

58. In the preparation of RPs for each project section with LAR impacts under KP-RRDP, a detailed assessment of LAR and its social impacts will be carried out, including an initial screening and categorization of impacts, a census of DPs with an inventory of lost assets (ILA), a socio-economic survey (SES), a detailed measurement survey (DMS) and valuation of lost assets (VLA). Comprehensive and accurate measurements of actual impacts will be undertaken and a final project section RP will be prepared. The results of the LAR impact assessment will be presented in aggregate form in the project section RP, as well as for each household in their annex.

A. Screening

59. All roads under KP-RRDP have been screened for IR impacts. For roads that have been screened as C for IR, a re-verification will be done prior to commencement of work to confirm absence of impacts and reported in a final social due diligence report (SDDR). At any stage of project implementation, if any unanticipated impact occurs, the corresponding resettlement planning document (RP/CAP) will be prepared. If the unanticipated impacts in a


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subproject/contract package is assessed as having significant IR impacts, such subproject/contract package will be excluded from KP-RRDP.

VII. CENSUS OF DISPLACED PERSONS AND INVENTORY OF LOST ASSETS (ILA)

60. At the beginning of the preparation of the census and ILA, the ESC's project staff and consultants tasked with LAR planning will work closely with the design engineers in the field to minimize LAR impact as much as technically feasible. The project LARP will contain a statement describing the efforts made to minimize LAR impacts. The LAR and engineering staff, in cooperation with the concerned land administration officials, will also prepare LAR Impact maps showing the alignment of project facilities and based on cadastral maps, the boundaries of properties so the affected land and structures can be identified. The map will be included in the project RP. The land administration officials will also be requested to provide existing records for the DPs and lost assets. Based on these records and the LAR Impact Maps, the LAR staff and consultants will undertake the census and inventory of lost assets in consultation with DPs at each affected property. If there are any differences in the list of DPs recorded before land award or at the time of notification under Section 9 of the LAA, the census of DPs will be updated, and list of DPs revised accordingly for inclusion in the LARP.

61. Using a questionnaire, a census enumerates all physically and economically displaced persons in a project, including all displaced households, and, if applicable, displaced enterprises. Displaced community assets will also be recorded by interviewing the officials or persons in charge. The census questionnaire will query the size and members of a displaced household, its project affected assets (land, structures) with estimated sizes and associated property status, as well as income sources (business, crops, employment). In addition, a limited number of socioeconomic characteristics of the displaced households, such as ethnicity, gender, age and education of its members, head of household, total income and its sources, as well as vulnerability in terms of poverty, age, disabilities and gender of household head, will be recorded. The census will also inquire into the compensation preferences and expectations of each displaced household.

62. The data on affected assets will be used to prepare a quantitative ILA as part of the LAR impact database, including land, immovable property (buildings and other structures), and income losses. The ILA will be corroborated or updated with information from relevant government sources, such as offices in charge of land administration and property registration. If necessary, outdated official records will be updated according to the current status of the DP's assets. If the LAR impact assessment is based on the feasibility design of a project, a preliminary project impact assessment and asset valuation will be prepared based on estimated impacts. If a final detailed engineering design is available, a complete census and updated ILA will provide the basis for the detailed measurement survey (DMS) indicating the final complete quantification of all lost assets caused by a project. The data from the census and ILA are presented in the section on the scope of LAR impacts in aggregate form, and for each individual household or legal entity in the annex of each RP. The census of 100% DPs and ILA (based on section 9 of LAA or land award) will be carried out by PIU/ESC officials and consultants deputed to the project's LAR tasks.

63. In each project PIU will publicly announce an eligibility cut-off date at the beginning of the census and notify the DPs about the LAR impact of the project.

VIII. SOCIO-ECONOMIC SURVEY (SES)



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64. A socio-economic survey will be carried out for the project section RP to obtain a detailed understanding of the social and economic conditions of the DPs and to provide baseline data for the monitoring of the implementation of the LARP and the impacts of the project. The SES will be carried out by the project staff and consultants deputed by C&W to undertake LAR work.

65. As appropriate, a combination of research methods will be used, including a quantitative sample survey, focus group discussions, key informant interviews and a walkthrough to observe the area in which the DPs live and work, in addition to a desk study of relevant secondary sources from official records and statistics, as well as academic and other subject matter related reports.

66. The sample size for the survey depends on the size of total affected households in a project. If the number is large (e.g. 500 or more) a sample of 10 percent of all affected households will be considered. All affected families termed as vulnerable, poor and severely affected households will be included in the survey. A smaller displaced population requires the sampling of a larger percentage. Sampling will be a combination of purposive selection of specific groups in the population from various affected locations and random selection within these groups.

67. The key variables covered in the surveys and qualitative interviews will include (i) demography; (ii) social organization; (iii) income and assets; (iv) occupational structure; (v) access to public services; and (vi) personal property. All data collection and presentation need to be disaggregated by gender and other relevant social characteristics, depending on the social groups of concern (for example IP, ethnic or vulnerable groups). The project section RP reports on the findings of the SES and provides observations on the wider social, economic and cultural context of the DPs. Special attention is paid to possible previous or future occurrence of displacement due to LAR among the communities of the DPs.

IX. DETAILED MEASUREMENT SURVEY (DMS) AND VALUATION OF LOST ASSETS (VLA)

68. The detailed measurement survey (DMS) and valuation of lost assets (VLA) provide an exact quantification and valuation of the assets lost due to the LAR impacts of a project. They will be carried out in collaboration with qualified appraisers of the BOR, SBP accredited valuers, certified companies, individuals and non-governmental organizations (NGOs) certified in valuation. A third-party with expertise in valuation will be engaged as an independent third party to observe and verify or undertake the DMS and VLA process. The census of DPs, ILA and LAR impact maps guide the preparation of the DMS and VLA.

69. The DMS determines the exact size, type, and quality of each asset identified in the ILA. Existing records in land and property registries are referred to, but field measurements will be carried out by the project to verify exact quantities. The DMS covers all types of land and structures and identifies their property status. It is carried out in the presence of the DPs owning and/or using the assets concerned, who confirm the results of the DMS with their signature. In case of a dispute, the project's LAR specialist and the agency tasked with the DMS seek to resolve disagreements in situ or the issue is referred to the Grievance Redress Mechanism. The DMS will also identify income losses of displaced businesses and their employees, based on official records, including contracts, tax records, and accounts. Income losses from agricultural activity will assess lost harvests, measuring the quantities of all applicable types of lost crops and trees.

70. The VLA will assess (for e.g. assessment by District Assessment Committee in KP) the value of all lost assets according to the principle of replacement cost and other provisions in the chapter on eligibility and entitlements of this LARF. Thus, the lost assets of DPs will be replaced


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either in cash or in kind. This requires that the exact quantity, type and quality of lost land, structures, businesses, jobs or crops are identified by the DMS and an accurate value constituting full replacement cost be assessed. LARF indicates the agreed definition of replacement cost as involving fair market value, transactions costs, interest accrued, transitional and restoration costs and other applicable payments, if any, without depreciation. Each project section RP will specify the procedures and explain the assessment methodologies used in the VLA for a project under this project/facility.

71. As the legal framework for land acquisition in Pakistan does not permit payment of compensation rates above government (BOR) rates, the assets lost due to project will be assessed according to the principle of replacement cost as outlined in this LARF. The BOR considers average market rate based on registered land transactions as fair market value although this is not compatible with ADB's requirement of replacement cost. Therefore, the difference between BOR and RC will need to be worked out through a valuation study by qualified and experienced experts. In cases where compensation has been already awarded, the BOR, under the prevailing LAA practice, is not authorized to accept or reject any additional amount of compensation (over and above the BOR price). However, PIU will be required to arrange the balance amount and pay to the DPs to comply with the conditions of the loan agreement.

X. CONSULTATION, PARTICIPATION AND INFORMATION DISCLOSURE

A. Consultation Strategy

72. For each project under the Sector Lending, PIU through ESC and project team will implement a comprehensive consultation, participation and information disclosure strategy to ensure the DPs are meaningfully consulted in LAR process; their views and concerns are fully considered, and appropriate steps taken to resolve them. The consultations will involve the displaced persons and other relevant stakeholders including community leaders host communities, civil society organizations (CSOs) and non-governmental organizations, district government, project staff and consultants.

73. The project section RPs will provide a stakeholder analysis of all persons who are directly or indirectly involved in the project, including DPs, project and related government staff, and host communities, and determine the need for consultation, participation and information. Consultation and information disclosure is an ongoing process, which starts with field investigations for the design of the project alignment, through preparation of project section RPs, RP implementation and monitoring, and ends after the final evaluation of RP implementation.

74. Formal consultation meetings will be held with all DPs and will also include participation from project LAR staff and consultants, district revenue officials as well as representatives of civil society organizations (CSO) or Non-governmental organizations (NGO) and other pertinent stakeholders. The project section RPs, based on the results of consultations and impact surveys in the field, will be disclosed. In particular the DPs will be informed about their rights and obligations, the institutional arrangements, the procedures which need to be followed, and the grievance redress mechanism (GRM). During RP preparation, the official eligibility cut-off date for the project will be announced at every meeting with DPs. Every revision and update of the draft LARP requires a new disclosure and consultation meeting with DPs. Any critical issue and complaint will be raised, discussed and resolved, if possible, at these meetings.



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75. Separate meetings with women and vulnerable DPs will be held so their voices are not constrained by those of men and powerful sections of the DP communities. In addition, individual meetings and focus group discussions (FGD) will be held formally and informally, as and when the opportunity or need arises during field activities, such as census, IOL, SES, DMS and VLA. PIU will arrange joint field inspections of affected land and structures and of relocation sites among DPs and project staff and relevant government staff and other stakeholders to physically inspect and verify impacts, and to ascertain the state of suitability and readiness of relocation sites (where required). Individual negotiation meetings will be held with DPs, as necessary, to resolve any disagreements and reach individual agreements.

76. The consultation meetings and other consultation activities will be recorded and documented comprehensively, including signed attendance lists, photographs and minutes of the key issues addressed and agreements reached, observations made in the field, and outstanding issues in need of being addressed. The consultations will be documented in the RPs with consultation records appended. Consultations will be continued in the LAR monitoring reports of the PMSC Resettlement Specialist.

77. The Project LAR staff and consultants will prepare a LAR Information Booklet for all DPs in the local language(s) with concise information on all of the key aspects of the LAR process of a project, such as project description, legal framework, institutional arrangements, grievance mechanism, general eligibility and entitlement provisions, assessment of impacts, payment of compensation strategy, and the timing of LAR activities. In addition, the cut-off date and other information on relevant issues will be disclosed/publicized to DPs and other stakeholders in the project area through leaflets and brochures (in local language) made available at project and relevant government offices. All information dissemination will be made in the local languages. For illiterate DPs oral and/or pictorial means of communication will be used.

78. After reaching mutual agreement on the RP in the formal consultation meetings, the draft and final LARPs endorsed by the government will be disclosed on the ADB website. All detailed specific information for displaced persons and their households will be kept anonymous in publicly disclosed documents by omitting their names. However, project will maintain a computerized database of project-specific LAR impacts and lists of all the DPs with inventory of losses by types. This computerized database will be updated and maintained in a retrievable system. During internal monitoring of RP, the project LAR staff will carry out individual and focus group meetings with the DPs to record the process and impact of RP implementation for each project.

B. Disclosure

79. The LARF, RPs and CAPs and information brochure will need to be translated into Urdu and disclosed to the DPs and placed in accessible places and in a form understandable to DPs and other stakeholders, including the relevant PIU and union offices. The LARF, RPs and CAPs will also be disclosed in English and Urdu on ADB and C&W's websites. The LARF, RPs and CAPs will also be disclosed on ADB's website. Internal monitoring reports of RP/CAP implementation will also be disclosed to the DPs and on ADB's website. PIU will closely monitor the disclosure of these documents.

XI. INSTITUTIONAL ARRANGEMENTS

80. C&W Department will be the project executing agency (EA). The project implementation unit (PIU) will be the implementing agency responsible for the day-to-day management of the


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project. An Environmental and Social Cell (ESC), headed by a Deputy Director, has been established at PIU to manage the tasks and activities including handling/resolving any complaints or grievances of those displaced by the project (DPs) and fulfilling safeguard requirements. Moreover, a Resettlement Specialist will be appointed by the PMCSC for providing technical assistance to ESC in safeguard related matters. The organogram of the institutional arrangement is reflected in Fig 5.1.

81. In terms of RP implementation, C&W and PIU shall ensure that land and ROW required for the project are made available to the contractor in according with the agreed schedule and land acquisition and resettlement activities are implemented in compliance with all applicable laws and regulations of Pakistan, ADB's SPS, 2009 and measures in the form of preparation and implementation of RP followed by the corrective action plan based on the monitoring report.

82. The roles and responsibilities for the planning, implementation, and supervision of LAR functions of institutional actors are defined below and presented in table 5-1.

Fig 5.1: Organizational Structure of the KPK Rural Road Development Project

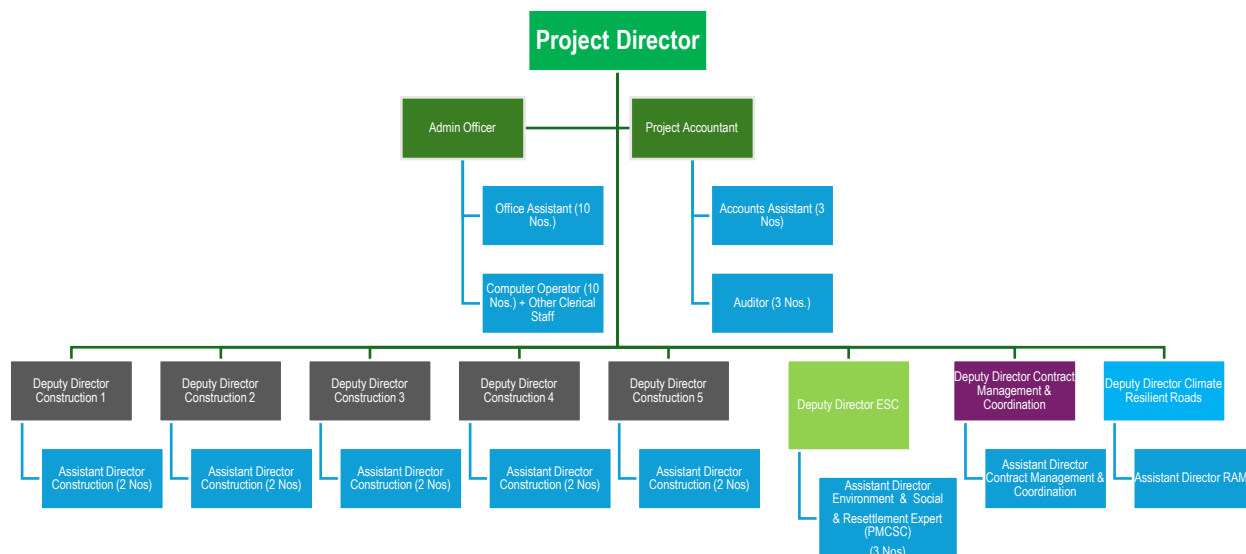


Table 5-1: Institutional Roles and Responsibilities

S#	Institution	Roles and Responsibilities
1	PIU	The overall coordination will be provided by Project Implementation Unit (PIU) at Peshawar (headed by the Project Director) in addition to recruitment of consultant, contract signing and preparation of key reports. The Social and Environment team under the ESC is already in place to manage the LAR-tasks and activities including handling/resolving any complaints or grievances of those displaced by the Project (DPs).
2	Contractor	The contractor is responsible for the construction works under the social and environmental conditions.


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3	PMSCC	PMSCC is responsible for the overall supervision of the projects and ensures that RP is implemented in a smooth and timely manner in accordance with the provisions of the RP.
4	District Government	Role of district administration is to provide full support and coordination to all stakeholders and keep law and order related to security measures.
5	Community	Local Community is the affectees as well as beneficiary of the sub-project. Community is responsible to resolve social conflicts and to safeguard their rights.
6	ADB	ADB is the international financing institution and has a supervisory role.
7	Revenue Department	The District Collector/Deputy Commissioner is responsible for the evaluation of the lost assets and disbursement of the compensations to DPs for their lost assets.

A. Project Management Construction Supervision Consultants

83. The Project Management Construction supervision consultants will report to PIU and prepare the implementation program, quality of works, delivery of works, and certify the quantities of work carried out and the payments. The PMSCC will also help the PIU in project planning and management, quarterly progress reporting, procurement planning, contract management, financial management and overall project management. They will also be tasked to implement the RPs/CAPs prepared for the project. Their scope of work will include but not be limited to the following:

- (i) Preparation of database of all the affected households and review their eligibility and entitlement based on the final RP/CAP.
- (ii) Assist in disbursement of compensation and ensure that affected persons are compensated as per the RP/CAP before commencement of civil works in the LAR affected project road sections.
- (iii) Distribute the notices to the entitled DPs regarding their payment of compensation.
- (iv) Provide proper guidance to DPs for the submission of their requests for compensation as per eligibility and entitlement.
- (v) Facilitate the DPs in compensation payment through the completion of necessary documentation to receive their entitled payments like payment vouchers, opening of bank account and formation of CNIC, etc.
- (vi) Facilitate the DPs in term of resolving the legal and administrative impediments for the compensation payment.
- (vii) Help the DPs to put their complaints (if any) in front of GRCs.
- (viii) Conduct the community consultation and disclosure process throughout the sub-project cycle.
- (ix) Assist PIU/ESC in the preparation of progress and monitoring reports.
- (x) Review, monitor and evaluate the effectiveness with which the RP is implemented, and recommend necessary corrective actions to be taken. Advise on corrective measures where necessary to the PIU.



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B. Grievance Redress Committees (GRCs)

84. Grievance redress committee will be established for addressing conflicts and appeal procedures regarding project design, compensation assessment, eligibility and entitlements followed in the implementation of resettlement activities, and impacts of construction work including the jobs to DPs and local population etc. GRCs will receive and facilitate the resolution of affected persons' concerns and grievances. It explains how the procedures are accessible to affected persons and are gender sensitive.

C. District Government

85. District Government based agencies have jurisdiction over compensation activities. The Revenue Department, most notably Patwari, carries out specific roles such as preparation and verification of the land record. Functions pertaining to compensation of non-land assets rest on Provincial line agencies and their city level offices. Crops compensation pertains to the Department of Agriculture; the compensation for wood trees losses pertain to the Department of Forestry and the building structure will be assessed through the building and works department.

D. Displaced Persons Committee

86. The DPs will be encouraged and mobilized to form a Displaced Persons Committee (DPC). DP representation facilitates communication and information flow among DPs and with other stakeholders. The representatives will closely liaison with Grievance Redress Committees (GRC) formed at PIU, District Office and field levels. The DPC will meet monthly and on demand from members, due to Land Acquisition and Resettlement planning and implementation issues. The DPC members may elect from among themselves a representative to the GRC or hold elections in a meeting of all project DPs.

E. Asian Development Bank (ADB)

87. ADB reviews RPs/CAPs and confirms their responsiveness to ADB's safeguards requirements. In cases where these do not meet ADB's requirements, additional assessment and improvement of the RP will be undertaken. ADB will also conduct periodic social safeguards reviews; to verify that land acquisition and resettlement planning, and implementation is being carried out as agreed in this LARF and approved RPs/CAPs.

XII. GRIEVANCE REDRESS MECHANISM (GRM)

88. An integrated grievance redress mechanism (GRM) for environmental and social issues will be established at the field, district, and project level to facilitate the timely resolution of complaints for the local communities, concerning the social and environmental aspects or to address any unanticipated impacts related to the project. The GRM will be operated transparently and in a participatory manner. Comprehensive details of the GRM, including its procedures, planned actions and actions taken, will be widely disseminated, particularly among local communities including the roadside community with the GRM registers remaining accessible to communities and other stakeholders. The GRM is designed to be gender-responsive, culturally appropriate, and readily accessible to stakeholders at no cost and without fear of retribution. Stepwise process of the proposed GRM is summarized below.

89. **Stage 1:** The affected person(s) may submit an oral or written complaint to the GRC at Field Level. The GRC will log the complaint along with relevant details in the community complaint


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register. The displaced person(s) can directly approach GRC. For each complaint, the GRC must investigate the complaint, assess its appropriateness/eligibility, and identify an appropriate solution. It will provide a clear response within seven working days to the complainant, PIU and Contractor (where relevant). The GRC will, as appropriate, instruct the responsible entity to take corrective actions. The GRC will review the responsible entity's response and undertake additional monitoring as needed. During the complaint investigation, the GRC will work in close consultations with the Contractors, the PMSC Consultants, PIU and other relevant agencies. The responsible entity should implement the redress solution and convey the outcome to GRC within seven working days.

90. **Stage 2:** If no solution can be identified by the GRC or if the complainant is not satisfied with the suggested solution under Stage 1, the complainant can approach stage 2 at District Level (Deputy Commissioner Office). The committee will review the case and give the solution within seven days of its submission.

91. **Stage 3:** In case of dissatisfaction of the complainant at stage 2, he/she can approach stage 3 at PIU level. Here, the GRC is headed by the Project Director. The GRC at PIU level will resolve the complaint/grievance and the agreed action thus determined should be implemented within twenty-one days (if additional time is needed to implement the corrective action, it should be discussed and decided during the meeting).

92. The GRC cannot impede a DP's access to the legal system. Thus, a DP can approach the courts at any time in accordance with the applicable legal provisions as per Section 18 of Land Acquisition Act 1894. Besides, If dissatisfaction persists after stage 3, the complainant may approach the ADB Operations Department (CWRD) or the ADB Pakistan Resident Mission to obtain support in seeking resolution to his complaint. As a final resort, the complainant may approach the ADB's Accountability Mechanism.

93. Implementing the GRC's decision will be contractually binding on the contractor.



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XIII. LAND ACQUISITION AND RESETTLEMENT BUDGET

94. All resettlement funds will be provided by the KPK Government. The EA will ensure to use these funds for the disbursement of compensation payment and other assistance as required in the LARF and approved RPs. All eligible compensation and support will be fully disbursed among the DPs prior to the commencement of civil works in the LAR affected areas. Detailed implementation procedures will be described in the approved RPs/CAPs. The project has already allocated Rs.400 million for compensation, shifting of utilities, and other social expenses as per PC-I. If the project requires additional funds to cover unforeseen expenses for compensation disbursement, these can be sourced from the provisional amount of Rs.7892.40 million designated for physical and price contingencies. The C&W department, through the PIU, will ensure the timely disbursement of compensation payments to the DPs. The Project will ensure that the land acquisition and resettlement funds are delivered on time to the District Collector. The Project will also ensure that funds for entitlements under the LARP are fully provided to DPs prior to commencement of civil work. Compensation and resettlement funds will be provided to the DPs in two separate ways: (i) Compensation under law for acquisition of land will be disbursed through the District Collector; and (ii) Additional assistance for resettlement of DPs will be disbursed directly by PIU with the assistance of the respective Project Team.


XIV. MONITORING, EVALUATION AND REPORTING ARRANGEMENTS

95. Monitoring is a major part of the resettlement management system to ensure its goals are adequately met. Activities agreed in the LARF will have to implement in timely manner with close supervision of PIU/ESC and performed activities will be monitored internally. The safeguards staff within the PMSC will implement and monitor all the LARP activities. Monitoring of the LARP implementation and safeguards compliance will be internal. PIU/ESC will do ongoing internal monitoring and submit to ADB a semi-annual social monitoring reports to ADB covering the period from January to June and July to December, submitting them to ADB before the 15th of the following month. Monitoring reports will be disclosed in the EA and ADB website after clearance. These reports will describe the progress of the implementation of resettlement activities and compliance issues, if any, and corrective actions taken to address them. These reports will closely follow the involuntary resettlement monitoring indicators agreed at the time of resettlement plan approval.


96. PIU will submit safeguard monitoring report to ADB semi-annually to C&W management and ADB. This report will cover: (i) progress on compensation payments and payments for all types of impacts and losses; (ii) performance indicators data to help assess whether the planned resettlement activities are producing the desired outcomes; (iii) progress of livelihood life skill training; (iv) status of consultations, and redress of grievances; (v) consultation, communication and participation with vulnerable groups including affected persons; and (vi) to make corrective actions if unanticipated impacts or non-compliance will be noted during monitoring and to assess the unanticipated problems raised during project implementation. Monitoring components and performance indicators relevant to social performance monitoring to be addressed in semi-annual monitoring reports will be prepared. During the monitoring period both qualitative and quantitative information will be monitored. Resettlement activities to be carried out monitoring indicators for measuring the activities are given in Table 8.1.

Table 8.1: Monitoring Indicators

Category	Indicative Indicators
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Consultation, Participation and Disclosure	Is a summary of the RP disclosed locally so that all affected households may easily access it, including APs, women and other vulnerable people?
	Have consultations taken place as scheduled, including personal and household meetings, focus groups, and community forums?
	Have leaflets about resettlement impacts been prepared and distributed to affected persons in local dialects?
	How many consultation meetings are being held, and how many people participated, disaggregating by cast, ethnicity, gender?
	Have consultations been made separately with DPs and other vulnerable persons?
	How many DPs are aware of their entitlements?
	How many displaced households (DHs) confirm receipt of the proposed entitlements plan?
	How many DHs agree to the proposed entitlements plan?
	How many complaints regarding entitlements have been registered in the grievance redress mechanism?
	How many overall complaints have been registered in the grievance regress mechanism?
Compensation disbursement and budget allocation	How has further consultation been carried out during project implementation?
	Have all DPs received compensation as provided under the Entitlement Matrix?
	Have all DPs received compensation for the land of ROW restricted areas?
	Have all DPs received additional assistances according to type of impact?
	Have all DPs received payments on time?
Resettlement Assistance and other allowance	Was allocated budget sufficient to compensate for loss of land and other assets and to provide resettlement assistance? Were financial resources made available in time?
	Have all DPs as per RP including vulnerable households, women headed households, received resettlement assistance?
	Have all DHs received transitional assistance as set out in the Entitlement Matrix
	Have all severely affected households received cash assistance as provided under the entitlement matrix?
Livelihood and income restoration	How many affected households rebuild their residential structures and have received amounts sufficient or not to construct a new and similar building?
	How many DPs including severely affected, vulnerable persons under rehabilitation program received energy-based livelihoods skills training (disaggregated by cast, ethnicity, male, female, vulnerable and indigenous persons)?
	How many people have been self-employed or become a job holder in local markets after getting the skill training?
	How many persons started new enterprises after getting livelihood enhancement training (disaggregated by cast, ethnicity, male, female, vulnerable and indigenous people)?
	How many numbers of affected persons are employed in project activities including as targeted in entitlement matrix?


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	Have all severely affected households been able to restore their livelihoods and sources of income?
Grievances Redress Mechanism	Was the project GRM constituted for the resolution of complaints as anticipated in the RP?
	How complaints/grievances have been lodged and resolved?
	Are complainants satisfied with decisions made and time taken for to resolve grievances through the GRC?
Institutional arrangement	Have all proposed staff in PIU been fulfilled before project implementation?


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