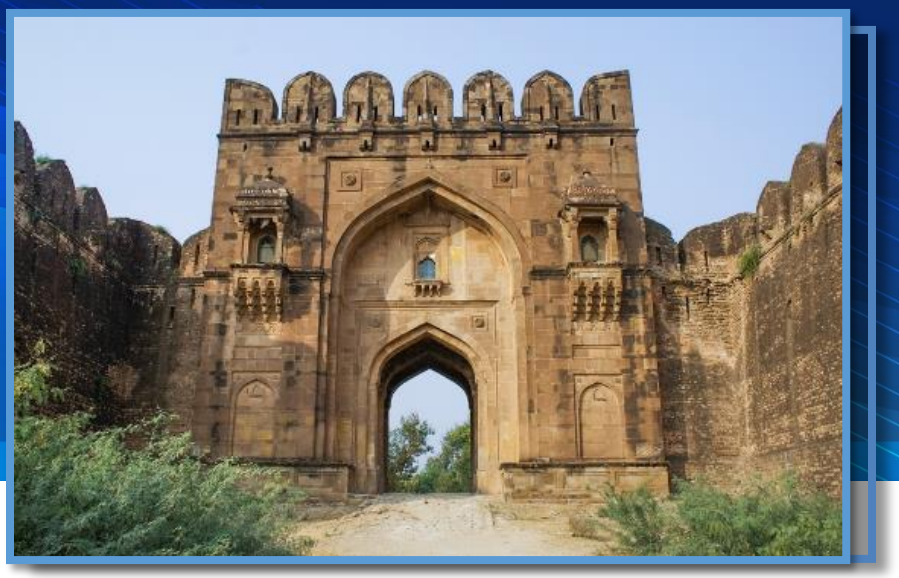
ENVIRONMENT AND SOCIAL MANAGEMENT PLAN (ESMP)



Construction of Rohtas Fort Bypass Road Length = 3.21Km

District Jhelum

July 2023

PUNJAB
TOURISM FOR ECONOMIC GROWTH

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LIST OF ABBREVIATION

ARAP	Abbreviated Resettlement Action Plan
C&W	Communication and Works Department
CBO	Community Based Organization
CESMP	Contractor Environmental and Social Management Plan
DCO	District Coordination Officer
DFO	District Forest Officer
DO	District Officer
EA	Environmental Assessment
ES	Environment Specialist
EPA	Environment Protection Agency
EPD	Environment Protection Department
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ETPB	Evacuee Trust Property Board
GDP	Gross Domestic Product
GRM	Grievance Redress Mechanism
GT Road	Grand Trunk Road
LAA	Land Acquisition Act
M and E	Monitoring and Evaluation
MSDS	Material Safety Data Sheet
NGO	Non-Governmental Organization
OP	Operational Policy
PEPA	Punjab Environment Protection Agency
PEQS	Punjab Environment Quality Standard
P&DD	Planning and Development Department
PAP	Project Affected Persons
PCR	Physical Cultural Resources
PPE	Personal Protective Equipment
PIC	Project Implementation Consultants
PIU	Project Implementation Unit
PKR	Pakistan Rupees
PTEG	Punjab Tourism for Economic Growth
RAP	Resettlement Action Policy
ROW	Right of Way
RPF	Resettlement Policy Framework
SS and GS	Social Safeguard and Gender Specialist

TDCP	Tourism Development Corporation of Punjab
TSP	Total Suspended Particles
TMA	Tehsil Municipal Authority
WB	World Bank
WHO	World Health Organization

EXECUTIVE SUMMARY

Pakistan ranks 121st according to the World Economic Forum report on Travel and Tourism Competences, which is lowest in South Asia region. The ranking is based on enabling environment, travel and tourism policy, infrastructure, and natural and cultural resources. The main reason of Pakistan's low ranking are least favourable safety and security environment for tourists. The Government of Pakistan is focusing on tourism sector through taking organised and effective initiatives. The Government of Punjab has recently devised a tourism policy that focuses on promoting more than 20 sectors such as tour operators, NGOs, travel agents, heritage sites etc.[1].

Under the Punjab Tourism for Economic Growth Project (PTEGP), the provincial government will spend $50 million for harmonising tourism in line with international standards. Punjab Tourism for Economic Growth Project focuses on improving infrastructure facilities, determining the potential for private sector investment, creation of jobs and showcasing the rich heritage of the country. The project aims to tap the tourism potential in Pakistan and enhance regional connectivity.

The project primarily consists of four components which are; (i) strengthening of tourism destination management (governance, coordination and marketing); (ii) improving access and support facilities; (iii) facilitation and promotion of private investment and entrepreneurship; and (iv) project management and evaluation. The interventions would protect and strengthen the integrity and governance of the sites, improve the overall tourist experience, and ensure that local communities integrate in the eco-systems of the sites and benefit from it.

The details of sub-projects to be executed under the PTEGP was not available during the project initiation, so an Environmental and Social Management Framework (ESMF) was prepared for PTEGP in December 2016.

This report comprised on Environmental and Social Management plan (ESMP) for the proposed sub-project i.e.

Construction of Rohtas Fort Bypass Road Length = 3.21Km in District Jhelum

(The proposed road layout plan and other project details are provided in chapter 2)

The ESMP is prepared in compliance with Provincial and national legislation, and the World Bank's Operational Policies (OPs) as well as project's approved ESMF.

The baseline data was analyzed to identify potential environmental impacts of the project. A risk based methodology was adopted to identify high risk activities and suggest their mitigation measures. Proposed mitigation measures are based on the selection and siting of the construction to minimize potential adverse impacts identified during screening and to mitigate any residual impacts that may still arise after all precautions against risks have been put in place. A training plan provided in this report will help to ensure that the requirements of the ESMP are clearly understood and followed by all project personnel. Trainings will be given to the site workers, working at different levels (managers, supervisors, labour etc.) and stages of the project (construction and operational phases).

[1] https://dailytimes.com.pk/477232/potential-and-need-of-promoting-tourism-in-pakistan/
Punjab tourism policy 2019

Further, the sub-project area does not fall in sensitive wildlife habitat and no significant, irreversible or non-mitigable adverse environmental impacts identified. Primarily, environment & social impacts are associated with construction activities including temporary noise and air pollution, solid waste pollution etc. for which proper mitigation measures are proposed in chapter six under section 6.1 “Environmental and Social Management and Monitoring Plan”.

20 Kanal of private land will be acquired. The private land which needs to be acquired for the project is shown on environmental study area map included in chapter 4. Baseline Condition of this report. Co-ordinate of starting point of the road is 32.9731649N, 73.5850451E. There are no residential or other structure identified within the proposed layout of the road and hence no resettlement require for this project. Since, the number of affected persons (land owners of private land which need to be acquired) are likely to be well below than 200 and therefore Abbreviated Resettlement Action plan (ARAP) will be prepared in accordance to the applicable national/provincial rules & regulations and World Bank Resettlement Policy 4.12. The ARAP will be implemented and compensation will be made to the affected persons before commence construction activities on site. The compensation rate and other details of the land acquisition process will be provided in the ARAP.

The Environmental and Social Management Framework (ESMF) prepared for the project includes generic environmental and social impacts and their mitigation measures for the sub-projects of PTEGP.

The ESMF evaluate overall environmental and social impacts of the project and outlines an Environmental and Social Management and Monitoring Plan (ESMMP) need to be prepared for the sub-projects as per the requirement of legal administrated framework. Resettlement Policy Framework (RPF) is also prepared for PTEGP and provides a guideline for responding to the social environmental impacts of sub-project.

The proposed sub-project is screened to assess the environment & social impacts as described in the ESMF document.

The proposed bypass road is about 600 to 700m away from the boundary of the Rohtas Fort and no archaeological adverse impact of the proposed work scheme is anticipated, therefore, OP 4.11 (Physical Cultural Resources) is not triggered in this sub-project.

Proposed Civil Works

I.	Formation width	44 ft.
II.	Metalled Width	24 ft.
III.	Sub Base Course	8”
IV.	Base Course	8”
V.	Asphalt Course	2” thick
VI.	Construction of culverts	4 Nos
VII.	Retaining wall	1664 Rft
VIII.	Breast Wall	3800 Rft
IX.	Breast wall cum drain	3800 Rft
X.	Road Furniture	3.21 Km
XI.	Two Bridges at crossing of Naalah Ghaan	2 Nos

Environmental Baseline

A. Physical Environment:

I. Surface and Groundwater Resources

Surface water sources of the area are mainly utilised for domestic (washing, gardening but not for drinking purpose), irrigation and livestock purposes. Groundwater utilizations by the local community include human consumption and irrigation purposes. Naalah Ghaan (also known as Rohtas Fort Naalah) and River Jhelum are major surface water bodies in the area.

II. Ambient Air Quality

The 24 hours monitoring of ambient air quality for specific sub-project site has been carried out at 01 location. All the monitored determinants were within the Punjab Environmental Quality Standards (PEQS), except dust pollution ($PM_{2.5}$) which was detected marginally elevated. The suite of pollutants monitored were as follows:

- Nitrogen Oxides (NOx as NO, NO_2)
- Sulphur Dioxide (SOx)
- Carbon Monoxide (CO)
- Particulate Matter (PM_{10})
- Particulate Matter ($PM_{2.5}$)
- TSPM (Total Suspended Particulate Matter)

III. Noise

24 hours noise level monitoring was carried out at one point within the sub-project area near the existing road. The average value of noise was 56.7dB and was within the PEQS for commercial area i.e. 65dB. Major source of noise generation is vehicular traffic along the main road.

IV. Soil profile

Topography of the project area can be divided into two regime i.e. hilly terrain and comparatively flat area. The hilly terrain belongs to the Salt Range mountain. Salt Range area consists on series of hills and low mountains between the valleys of Indus and Jhelum rivers. The age of Salt Range Formation is Precambrian and trending east-west. Most of the length of the proposed road located in the hilly terrain, except about 1000ft length of northern part of the road which lies in the flat area (seasonal agricultural land (barani area)). Agricultural land identified at north and northwest of the proposed road. Patches of flat area within the hilly terrain are utilised for agriculture using the rain water for cultivation. Overall the agricultural potential of the land improves closer to the river Jhelum and other surface water bodies of the area i.e Naalah Ghaan (also known as Rohtas Fort Naalah). The hilly area is currently zoned as forest area where wild bushes are extensively found with scattered mature trees throughout in the project area.

V. Climate

The sub-project has a monsoon-influenced humid subtropical climate (Köppen climate classification Cwa) and is extremely hot and humid in summer, and cold and generally dry in winter. The maximum recorded temperature in the pre-monsoon season of April to June is 49.2 °C (120.6 °F), whereas in winter the minimum temperature recorded is −0.6 °C (30.9 °F). Average annual rainfall is about 850 millimetres (33 in) which is much below the evaporation rate of the area[2].

B. Biological Environment

I. Flora

No organised tree plantation e.g. orchards or commercial plantation identified in the project area. The natural vegetation of the area mainly comprised on Phulai (*Acacia modesta*). Other

[2] https://www.weather-pk.com/en/pakistan/jhelum-climate

low height trees and bushes including Mesquite (*Prosopis glandulosa*) and Bari (*Zizyphus mauritiana*) are common in the area.

II. Fauna

The proposed road located in forest area and provides habitat of wildlife. The reported wildlife in the area includes Jackal (*Canis aureus*), Wild Boar (*Sus scrofa*), Porcupine (*Erethizon dorsatum*), Hare (*Lepus nigricollis*), Partridges (Grey francolin (*Ortygornis pondicerianus*) and black francolin (*Francolinus francolinus*) and Rock Pigeon (*Columba livia*)

C. Social Baseline

I. Communication and utilities

Telephone facility and different mobile network available in the area. All the houses are connected to the national grid for electricity supply for domestic as well as agricultural use.

II. Means of Transport

Auto Rickshaws are a common mode of transport for short routes within the city. Many of the new rickshaws in the city use compressed natural gas (CNG) instead of the petrol engines as CNG is environmentally clean and cheaper than petrol. Rickshaws are another important mode of transportation. The older horse drawn “tongas” are now defunct although some can still be privately commissioned. Taxis and privately commissioned small passenger carrying vans are common public transport.

III. Land ownership

Total length of the road is 3.21 Km in which 20 Kanal (10,118m2) owned by privately owners and need to be acquired. All other require land for the proposed road is under possession of Punjab Forest Department, No objection certificate is attached as an Annexure B. The private land will be acquired as per Land Acquisition Act, 1894, Section 4 and World Bank operational Policy 4.12. There are two bridges with 700 ft. length each also require for crossing the water channel of proposed by pass road.

Impacts associated with biodiversity, air quality, soil, solid waste, labour health and safety, public convenience and safety, Physical Cultural Resources and land acquisition were assessed for design, construction and operational phase.

Environmental and Social Mitigation Measures

Mitigation measures are derived for the anticipated adverse environmental and social impacts of the sub-project. A risk based methodology was adopted to identify high risk activities and suggest their mitigation measures. Where possible, eliminating the risk by altering the scope of work, method of executing work activities etc. were preferred rather than minimizing the risk with control measures. The mitigation measures include the use of PPEs by labour, water spraying for dust control, limiting noisy activities near sensitive receptor e.g. school, hospital, sensitive wildlife habitat etc. and limiting work activities to day time only, fencing of construction area, and safety measures for prevention of COVID-19.

Consultation sessions were held with different stakeholder groups who may get affected by the proposed sub-project in accordance with the World Bank’s policy OP 4.01 at an early stage (during screening process) and during preparation of ESMP. Focus Group Discussions with local residents especially women were conducted to brief them about the sub-project activities.

Environmental monitoring will be carried out to ensure that all the construction activities comply and adhere applicable environmental standards, specifications. This will also help to ensure the implementation of suggested control measures reflected in this ESMP.

Grievance Redress Mechanism

A site-based Grievance Redress Mechanism (GRM) for the sub-project will be operational during the implementation of this ESMP. Grievance Redress will be processed as per the World Bank OP 4.12 which requires an appropriate and accessible grievance redress mechanism for affected persons, including displaced persons and host communities.

A multi-tier GRM has been proposed in the ESMF. At the district level, Dy. Commissioner Officer (DCO) Jhelum will act as the Grievance Redress Officer (GRO) of the grievance. At the PMU level, the Social Safeguard and Gender Specialist will be the focal person for the GRM.

GRM will provide an easy to access forum for stakeholders to officially launch any complaint (through complaint boxes, by post, via mail, in person etc.) against any project related activities or issues whereby, their complaints will be heard, registered and addressed by the project. The proposed GRM has time bound activities with clearly defined roles and responsibilities. All complaints received in writing or received verbally will be properly recorded and documented. An online GRM already exists and can be accessed at https://ptegp.punjab.gov.pk/grm.

The rates provided in the detailed estimate are based on market rates notified by the F.D for MRS, 1st BI-ANNUAL-2022 (1st January-2022 to 31ST July-2022). The total cost of the proposed work scheme i.e. Proposed Rohtas Fort Bypass is estimated to 1,604.154 million PKR.

CHAPTER - 1: INTRODUCTION

The Punjab Tourism for Economic Growth Project will put in place a tronger foundation for private sector participation in the tourism sector, including the new Tourism Policy framework, institutional reforms, improved governance, sector coordination, destination management and improved access and tourist facilities. The nascent tourism sector in Punjab is potentially a large niche market that will be developed to demonstrate the benefits that the sector can offer to the local economy.[3]

1.1 Sub-Project

The proposed Sub-project "Construction of Rohtas Fort Bypass Road Length = 3.21Km District Jhelum" falls in District Jehlum. 24 ft wide asphalt road including two number of bridges are proposed at nullah's crossing. The proposed alighnment of the road mainly falls within Forest land, however, about 1000 ft length of the road located within private land. The proposed work scheme was preliminary assessed from environmental and social point of view during the project screening process. To execute the sub-project activities including civil works for road construction, Environmental and Social Management Plan has been prepared.

1.2 Environment and Social Screening

Environmental and social screening report was furnished in year 2022. The scope of work considered for completing the screening report include:

- Construct Rohtas Fort Bypass Road;
- Rehabilitation/improvement of the existing road; and
- Infrastructure development inside the Fort i.e. development of washrooms, cafeteria/canteen, sitting arrangements, solar panels installation etc.

However, later the proposed bypass road and rehabilitation of existing road were separated from the infrastructure development works in Rohtas Fort. This ESMP only covers Rohtas Fort Bypass Road work.

Key findings of the E&S screening study are provided below:

- Private land acquisition will be required for the proposed bypass road and because the work area is close to the heritage site i.e. Rohtas Fort, following three World Bank Operational Policies are triggered
  - OP 4.01 Environmental Assessment;
  - OP 4.11 Physical Cultural Resources; and
  - OP 4.12 Involuntary Resettlement
- However, it is envisaged that OP 4.11 will not trigger for the proposed road works i.e. Rohtas Fort Bypass Road and Rehabilitation/improvement of existing road.
- The fort's name derives from the stronghold at Rohtas Garh which was conquered by Sher Shah Suri from Hindu prince in 1539.
- The fort was added to the list of world heritage sites by UNESCO in 1997.
- There are 12 gates of the Fort, names are provided in the screening report.
- The proposed Bypass Road located within forest area (thickly covered with natural plantation).
- The existing link road of many villages passes through the fort and one of the major factor of detraining the fort structure (material) is traffic congestion.

[3] Environment and Social Management Framework, 2016 (PTEGP)

- The proposed bypass road will have following key significant benefits:
  - To avoid damage to original structure of Rohtas Fort due to the vibration induced by moving heavy vehicles/traffic and accidental collision of vehicles with the Fort's structure.
  - Avoiding the accidents and hazard to tourists
  - Provide better facility of communication to the local community

Different options of proposed road layout were considered in the screening process and most environmentally friendly option (also considered in the detailed E&S studies) was recommended for further evaluation.

1.3 Need for the ESMP

The anticipated adverse environmental and social impacts of the sub-project are site specific, reversible and mitigatory measures can be design more readily. The sub-projects falls under category B projects in accordance to World Bank Operational Policy OP4.01 and therefore ESMP need to be prepared and implement on site during construction phase of the sub-project.

1.4 Objectives of Environmental and Social Management Plan (ESMP)

Following are the objectives of the ESMP:

i. Identify social and environmental impacts of the sub-project and related activities including implementation of Standard Operating Procedures (SOPs) for civil works during construction.

ii. Suggest suitable measures for reducing and mitigation of identified impacts at planning, designing and implementation stages of sub-project and to avoid, eliminate or reduce their adverse impacts, if any.

iii. Propose an environmental and social monitoring plan to ensure that mitigation measures are implemented during the sub-project execution and timely corrective actions are taken where required.

iv. Propose the institutional arrangements required to implement and monitor the ESMP.

v. To carry out periodic social and environmental monitoring and ensure compliance and reporting non-compliances in accordance with this ESMP.

vi. Capacity building of contractor and sub-project staff.

1.5 ESMP Methodology

Methodology for ESMP is already defined in the project ESMF. While the relevant forms/checklists to be adopted for environmental and social studies have been provided in the following sections of the project ESMF;

- Environmental and social screening form has been provided as Annexure-6.
- An involuntary resettlement screening checklist has been provided as Annexure-9.
- Guidelines for an environmental management plan EMP/ESMP has been provided as Annexure-8.
- Chance find procedures (if required) has been provided in Annexure-10.

The data required for completing above mentioned forms/checklist has been obtained from both primary (field visit/s, laboratory based monitoring/testing, consultations, project engineering document/s, designs etc.) and secondary sources (literature including documents/ reports/ papers/ dissertations/ encyclopedias both available online and in printed format/s etc.).

Stakeholder's consultations have been conducted with relevant person/s and organisation/s during the field surveys according to WB and Pakistan Environmental Protection Agency (EPA) guidelines. Moreover, relevant applicable legislation and policies have been reviewed according to the scope of the sub-project.

The baseline data was analyzed to identify potential environmental impacts of the project. A risk based methodology was adopted to identify high risk activities and suggest their mitigation measures. Where possible, eliminating the risk by altering the scope of work, method of executing work activities etc. rather than minimizing the risk with control measures. However, where the risk cannot be managed during design phase of the project, environmentally friendly and socially acceptable control measures are proposed to mitigate the adverse impacts of proposed work scheme during construction and operational phase of the project.

1.5.1 ESMP Implementation Budget

Budgetary requirements for the implementation of ESMP have been calculated and made part of the ESMP. Estimated ESMP implementation cost is 23.911 Million PKR, further detail of the cost is provided later in this report. Tree replenishment and compensation cost included in the ESMP cost. However, land acquisition compensation cost (ARAP cost) is not included in the ESMP cost. A separate standalone document forms the ARAP for this sub-project.

CHAPTER - 2: DESCRIPTION OF THE SUB-PROJECT

This chapter provides the details of proposed sub-project. The whole work scheme can be divided in two main components:

a) Proposed Rohtas Fort Bypass Road; and
b) Rehabilitation of existing road from the boundary of Rohtas Fort and confluence of proposed bypass road and the existing road.

2.1 Project Background

Rohtas Fort is a historical garrison fort constructed by Sher Shah Suri during 16th Century to subdue the rebellious tribes of Northern Punjab. The fort is a historical asset and is a popular tourist spot. The fort was inscribed by UNESCO as a World Heritage Site in 1997.

A metaled road from GT road near Dina city leading to many villages of Tehsil Dina and Sohawa is presently passing through the fort and all kinds of traffic such as buses, trucks, dumpers from salt range, cars, pickups and trollies are passing through the fort. The idea to construct Rohtas Bypass was initiated due to the following reasons:

- To provide alternate route to heavy traffic to avoid damage to original structure of Rohtas Fort being caused by the vibrations indced by moving traffic.
- To avoid accidents and hazard to tourist's life, especially due to movement of heavy traffic is casing nuisance for tourists.
- To improve torism by providing better means travelling.
- To provide the better facility of communication to the local people living in the nearby towns and villages.

Different alignments of the proposed bypass road were considered and the option which is most environmentally friendly and have minimum social impacts (mainly require minimum land acquisition) of the design was adopted.

2.2 Scope of Work

24ft wide asphalt road including two number bridges are proposed. Cross drainage/retaining structure is also included in the proposed work scheme due to hilly terrain of the area. The proposed alignment of subject bypass passes through the Forest land and in this context The Punjab Forest Department is consulted and NOC obtained from the department for the proposed scheme. Trees replenishment and compensation cost is included in the PC1 of the project as per the recommendation of Forest the Department. The total estimated cost of the proposed work scheme comes to Rs. 1,604.5 million. The salient features of the proposed work scheme are provided below:

a) Construct Rohtas Fort Bypass Road of following features;

I.	Formation width	44 ft.
II.	Metalled Width	24 ft.
III.	Sub Base Course	8"
IV.	Base Course	8"
V.	Asphalt Course	2" thick
VI.	Construction of culverts	4 Nos
VII.	Retaining wall	1664 Rft
VIII.	Breast Wall	3800 Rft
IX.	Breast wall cum drain	3800 Rft
X.	Road Furniture	3.21 Km
XI.	Two Bridges on Naalah Ghaan	2 Nos

About 1000ft of the proposed bypass road located within the private land. Approximately 20 kanals of private land will be acquired for the project. No resettlement requires for this component as no structure located within ROW of the proposed bypass road.

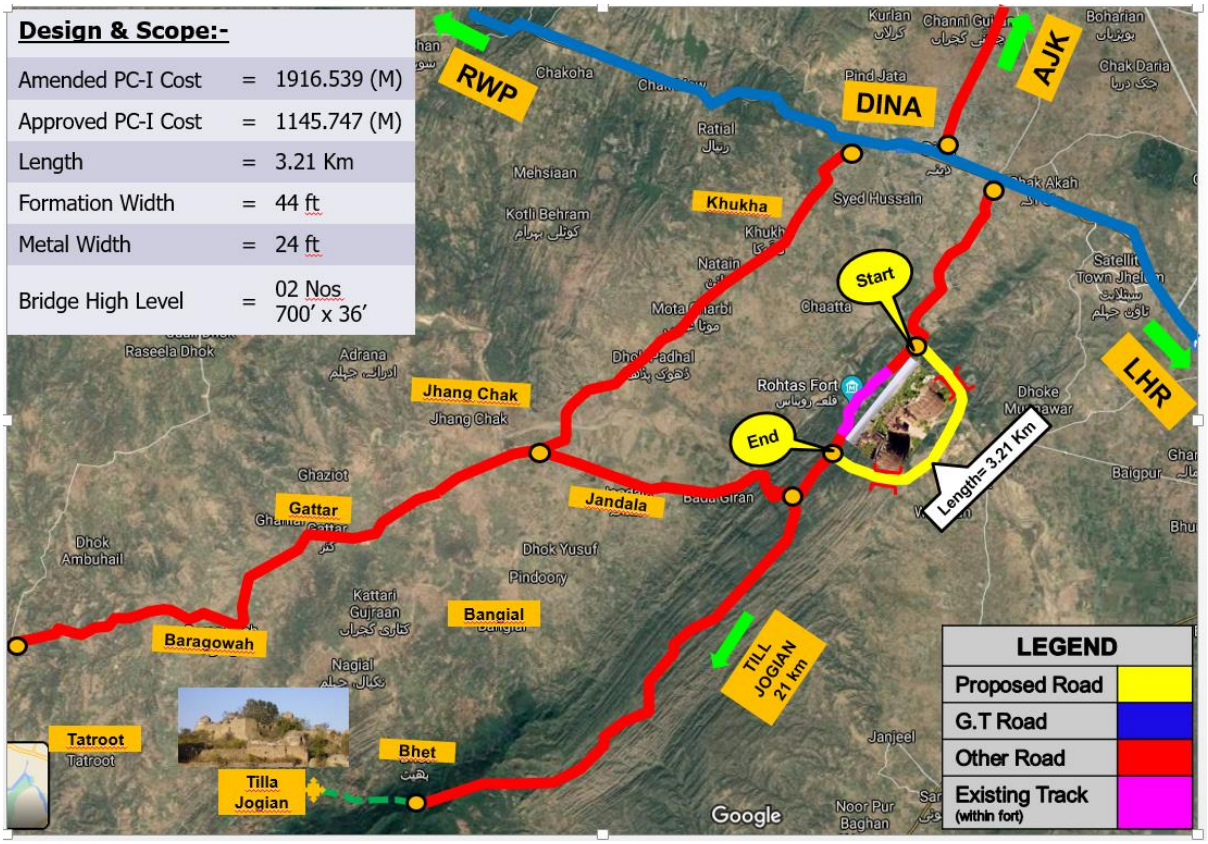


Figure 2-1: Proposed Work Scheme

2.3 Category of the sub-project

The proposed work scheme was assessed from environmental and social point of view during the project screening process. The sub-project involves Construction of Rohtas Fort Bypass Road Length = 3.21Km District Jhelum and rehabilitation of part of the existing road lies between the confluence of proposed bypass road and existing road and to the boundary boundary wall of the Fort. According to the nature of the proposed work scheme and environmental setting of the area, the sub-project was categorised as category B project according to WB's operational policy (OP 4.01).

Figure 2-2: Current status of Sub-project area

2.4 Labour Requirement

At the peak of construction activities, up to 100 labourers are likely to be deployed to the site for executing the project activities. It is anticipated that approximately 75% of the workforce will be available from the local resources while 25% of labour (mainly skilled labour) would be hired from other part of the country. The contractor will arrange living place for his migrated work force by renting a suitable house(s) near the project area. The project staff must respect local values and privacy of the local community. All site workers must follow site specific code of conduct and signed by all site workers prior to commencement of work. The site specific labour code of conduct should be prepared by the contractor and approved by the supervision consultant. Environmental & Social guidelines for the contractor are provided as an Annex-G.

2.5 Water Supply

During construction, water will be required for both construction activities and consumption by sub-project site based personnel. Water suitability has been monitored from EPD certified laboratory and found in compliance as per N/PEQS for drinking purposes. Results are included in Chapter 4 under section 4.2. However, it will be ensured that the community's water supply is not compromised or negatively impacted and requisite mitigation measures (if required) will be set in place. Contractor can use existing groundwater source(s) i.e. tube-wells privately installed in the area. The contractor will make necessary agreement with the owner of tube-well(s) before commence work on site. It is contractor's contractual obligation to conduct the mandatory water testing and ensure the water quality meets with require standards i.e. PEQS or technical specification for using at batching plant etc.

2.6 Waste Management & Disposal

The main types of waste expected to be generated and requiring disposal include:

Fuel, oils, and chemicals;

Sewage;

Campsite waste;

Demolition waste;

Packing waste; and,

Excess construction material.

Table 2-1: Waste Management Collection and Disposal Techniques

Activity	Best practices
Generation of construction material	• Implement resource conservation, and encourage staff (through training) to reduce waste, reuse waste and recycle waste wherever possible • Prohibit staff from fouling the site
Disposal of recyclable waste	Sell recyclable waste to local vendors
Disposal of construction material	• Do not burn materials which may lead to the release of toxic or hazardous substances • Do not burn materials on site when surrounding vegetation is dry and combustible.
Disposal of hazardous waste	Handover to specialized and certified disposal contractor
Generation of construction waste	Reduce construction waste by reusing waste as a fill material (prior testing required to confirm suitability of the waste of using as fill material)

2.7 Construction Schedule

From the beginning of construction to the commissioning of the sub-project, it is estimated to take approximately 18 months. The various construction phases of the sub-project are discussed in relation to mitigation measures (Chapter five, Section B under construction phase).

2.8 Contractor's Site Set Up

Approximately 75% of the workforce will be from the sub-project area while some 25% of labour (skilled) would be hired from outside the sub-project area. Contractor will rent out house(s) for 25% of the total workers. Site office and contractor's facilities i.e. batching plant, plant & equipment yard, material yard etc. will be developed near major construction site, preferably near the proposed bridges. Contractor will update the ESMP and prepare Contractor's ESMP (CESMP) before commence work on site. The CESMP will include site setup map indicating locations of contractor's facilities. Site office should be equipped with necessary welfare facilities including but not limited to toilet, cold and hot running water, rest area and canteen. Environmental and social guidelines provided as an Annexure G will form a part of the employment agreement of site based staff. Proposed training plan provided later in this report covers training on gender based violence and sexual exploitation and abuse.

2.9 Vegetation Removal/Tree cutting

As per discussion with Xen Forest, District Jhelum cutting of 1,256 of trees is anticipated (as shown in the NOC issued by Forest Department) in which 978 are Phulai trees, 277 Muskat trees and one Sheesham tree. Vegetation replenishment cost demanded by the Punjab Forest Department is included in the project cost and will be paid to the Forest department for clearing the area for the road construction and carrying out new plantation in the vicinity of the sub-project as a mitigation measure of tree cutting. New plantation can be carried out along the proposed bypass road. Designated forest area also available for new plantation within district Jhelum one of the reserve areas is located near village Dara Pur about 30km from the project area. All new plantation will be looked after by Punjab Forest Department.

Table 2-2: Project Summary[4]

Name of sub-project	Total length	Duration of sub-project	Scope of Work	Total cost of sub-project (Million)
Construction of Rohtas Fort Bypass Road Length = 3.21Km District Jhelum	3.21 km	18 months	Construction of new bypass road	Rs: 1,604.5 Million

[4] Estimated cost as proposed by C and W Department

CHAPTER - 3: ENVIRONMENTAL AND SOCIAL BASELINE CONDITION

This section provides an overview of the baseline condition of environmental and social aspects of the project area. The project site located in the administration boundary of Tahsil Dina, District Jhelum. About 20 thousand people also live within the Rohtas Fort boundary, called village Rohtas Fort. A medical dispensary, a primary school, grave yard, overhead water tank and water filtration plant identified in the village Rohtas Fort.

Dina city located about 10 miles at northwest of Jhelum city. The historic road constructed by Share Shah Sori (now called GT road) passes through the centre of city Dina. Small industrial units related to wood industry, iron industry and marble industry identified in the outskirts of the city.

3.1 Jhelum City Profile

Jhelum is a city on the east bank of the Jhelum River, which is located in the district of Jhelum in the north of Punjab province, Pakistan. Jhelum is known for providing many soldiers to the British Army before independence, and later to the Pakistan armed forces – due to which it is also known as City of Soldiers or Land of Martyrs and Warriors.[5]

The population of Jhelum city is about 188,800 (2012) and it is the 32nd largest city of Pakistan with respect to population. Total area of city is about 22 km^2 (8.5 sq mi). Population density of district Jhelum is 261/km^2. The majority of the population i.e. 98.47 percent is Muslim. Among the minorities Christians are in the majority sharing 1.36 percent in the district.

In addition to number of government and private high schools and colleges in the city there are three technical colleges named as Government Institute of Technology (Chak Daulat), Government Vocational Institute for Women (Civil Lines Jhelum) and Government Technical Training Institute. The University of the Punjab has established a campus in Jhelum offering programs related to business, commerce, law, and computer science. Jhelum also has two sub-campuses of the Virtual University of Pakistan.

3.2 Baseline Detail

A. Physical Parameters

1. Surface and Groundwater Resource

River Jhelum is the major source of surface water in the area. The river located about 15km at southeast of the fort. A seasonal river called River Kahan flows from west to east of the fort and falls into the river Jhelum. Naalah Ghaan (also known as Rohtas Fort Naalah) is a tributary of river Kahan flows along eastern boundary wall of the fort and merge with river Kahan at north of the fort. High flow in river Kahan is usually observed during raining season i.e. monsoon period between July and October every year. Major usages of surface water include domestic washing and irrigation purposes.

Major source of water for agriculture crop production and drinking purposes is withdrawn from ground water sources, however, availability and quality of groundwater does not fulfil drinking water criteria over the whole district Jhelum and therefore people also rely on surface water sources for drinking water at few places in the district Jhelum. Groundwater sample was collected from the existing source (existing tube-well) near the project area and compared with WHO guideliens and PEQS drinking water standards. Marginally elevated concentration of dissolved solids was found in the groundwater of the area. Other test results found in compliance with the WHO and PEQS. Groundwater test results comparison is provided in table 3.1. Surface water sample was collected from the seasonal stream on 1st June 2022.

[5] https://en.wikipedia.org/wiki/Jhelum

Test results are presented and capered with PEQS for drinking water standards in table 3.2. elevated concentration were recorded in microbiological,

Table 3-1: Groundwater Analysis

Sr. No.	Parameters	Unit	WHO	PEQS	Results
1.	E Coli	MPN/ 100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Nil
2.	Total Coli-form	MPN/ 100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Nil
3.	Faecal Coliform	MPN/ 100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Nil
4.	Colour	TCU	≤ 15	≤ 15	0.000
5.	Taste	-	Non-Objectionable / Acceptable	Non-Objectionable / Acceptable	Non-Objectionable
6.	Odour	-	Non-Objectionable / Acceptable	Non-Objectionable / Acceptable	Non-Objectionable
7.	Turbidity	NTU	< 5	< 5	0.20
8.	Total Hardness ^	mg/L	-	<500	510*
9.	Total Dissolved Solids ^	mg/L	< 1000	< 1000	1216*
10.	pH ^	-	6.5-8.5	6.5-8.5	7.610 at 25.5ºC
11.	Aluminium (Al)	mg/L	0.2	≤ 0.2	BDL
12.	Antimony (Sb)	mg/L	0.02	≤0.005	BDL
13.	Arsenic (As)	mg/L	0.01	≤ 0.05	0.0041
14.	Barium (Ba)	mg/L	0.7	0.7	BDL
15.	Boron (B)	mg/L	0.3	0.3	BDL
16.	Cadmium (Cd)^	mg/L	0.003	0.01	BDL
17.	Chloride (Cl^{-1}) ^	mg/L	250	< 250	165
18.	Chromium (Cr)^	mg/L	0.05	≤ 0.05	BDL
19.	Copper (Cu)^	mg/L	2	2	BDL
20.	Fluoride (F)	mg/L	1.5	≤ 1.5	1.4
21.	Lead (Pb)	mg/l	0.01	≤0.05	BDL

Sr. No.	Parameters	Unit	WHO	PEQS	Results
22.	Manganese (Mn)	mg/l	0.5	≤0.5	0.0037
23.	Mercury	mg/l	0.001	≤0.001	BDL
24.	Nickel	mg/l	0.02	≤0.02	BDL
25.	Nitrate	mg/l	50	≤50	0.014
26.	Nitrite	mg/l	3	≤3	0.009
27.	Selenium (Se)	mg/l	0.01	0.01	BDL
28.	Residual Chlorine	mg/l	-	0.2 – 0.5	0.02
29.	Zinc (Zn)	mg/l	3	5.0	0.0144
30.	Phenolic Compound	mg/l	0.002	-	BDL
31.	Sodium (Na)	mg/l	200	-	20.68
32.	Potassium (K)	mg/l	200	-	11.85

Table 3-2: Surface Water Analysis

Sr. No.	Parameters	Unit	PEQS	Results
1.	Total Coli-form	MPN/ 100ml	Must not be detectable in any 100 ml sample	34.7
2.	Faecal Coliform	MPN/ 100ml	Must not be detectable in any 100 ml sample	Nil
3.	Total Colony Count	MPN/ 100ml	Must not be detectable in any 100 ml sample	Nill
4.	Fecal Streptococci	MPN/ 100ml	Must not be detectable in any 100 ml sample	Nill
5.	Total Hardness	mg/l		612
6.	Total Dissolved Solids ^	mg/L	<500	267
7.	pH ^	-	6.5-8.5	8.023 at 23.1ºC
8.	Chloride (Cl^{-1}) ^	mg/L	<250	109
9.	Fluoride (F)	mg/L	≤1.5	0.6
10.	Nitrate	mg/l	≤50	25.2

Sr. No.	Parameters	Unit	PEQS	Results
11.	Total Iron (Fe)	mg/l	8 (for Inland Water Quality Standards)	0.6
12.	Carbonate	mg/l	-	40
13.	Bicarbonate	mg/l	-	200
14.	Calcium	mg/l	-	230
15.	Magnesium (Mg)	mg/l	-	11.8
16.	Total Suspended Solid	mg/l	200 (for Inland Water Quality Standards)	32
17.	Sulphate	mg/l	600 (for Inland Water Quality Standards)	180

2. Ambient Air Quality

The 24 hours monitoring of ambient air quality for specific sub-project site has been carried out at 01 location, average monitoring results provided in table 3.3, full results are included as an Annex-E. The pollutants monitored were as follows:

- Nitrogen Oxides (NOx as NO, NO_2)
- Sulphur Dioxide (SOx)
- Carbon Monoxide (CO)
- Particulate Matter (PM_{10})

Concentrations of all the air pollutants are in compliance with PEQS. All pollutant concentrations are in ug/m^3 except CO which is in mg/m^3

Table 3-3: Pollutant Concentration at Monitoring Point

Parameters	CO	NO	NO_2	SO_2	PM_{10}
	mg/m^3	µg/m^3	µg/m^3	µg/m^3	ug/m^3
Methodology	Non-Dispersive Infrared Absorption (NDIR)	Reduced Pressure Chemiluminescence (CLD)	Reduced Pressure Chemiluminescence (CLD)	UV fluorescence (UVF)	Integrated Sampling Technique
Result	0.8	3.30	30.30	35.9	137
PEQS for Ambient Air	**10 (1 hour)**	**40 (24 hour)**	**80 (24 hour)**	**120 (24 hour)**	**150 (24 hour)**

3. Noise

Noise level measurements were carried out at one point within the sub-project area. Major source of noise generation is vehicular traffic along the main road. The noise level results were within the PEQS Limits for commercial areas. The average noise level recorded at the project site is 56.7dB which is within the PEQS for commercial areas i.e. 65dB.

It is envisaged that noise will be generated during construction phase of the project due to the construction activities (plant & equipment operation, heavy vehicle movements, batching plant operation etc.) Mitigation measures have been suggested in mitigation table 6.1 and 6.3 in order to reduce its effects on the environment of the area. All the lab reports are annexed as an Annex-E.

4. Climate

The sub-project has a monsoon-influenced humid subtropical climate (Köppen climate classification Cwa) and is extremely hot and humid in summer, and cold and generally dry in winter. The maximum recorded temperature in the pre-monsoon season of April to June is 49.2 °C (120.6 °F), whereas in winter the minimum temperature recorded is −0.6 °C (30.9 °F). Average annual rainfall is about 850 millimetres (33 in) which is much below the required quantity given the extremely high evaporation levels.[6]

5. Soil Profile

The soils in the study area are generally of mixed agricultural potential comprising of fertilized land along Dina and granular and shallow rocky soil in nature which starts from Rohtas Road at 800ft onwards. The land is currently zoned as “Undetermined” with no use where only wild bushes are extensively found with a few numbers of tress scattered throughout in the sub-project.

B. Biological Parameters

1. Flora

Phulai Phulai (*Acacia modesta*) and Mesquite (*Prosopis glandulosa*) are most commonly found trees in the area. Other types of vegetation of the area include Bari (*Zizyphus mauritiana*), Keekar (*Acacia nilotica),* Shisham (*Dalbergia sissoo*) and Jangli booty (*Parthenium hysterophorus).*

Approximately first 1000ft of northern part of the proposed bypass road located within the *Barani* cultivated area i.e. cultivate during raining season only, the remaining length of the road lies within uneven naturally vegetated area. Main types of crop cultivate in Barani area include wheat and chick peas.

[6] https://www.weather-pk.com/en/pakistan/jhelum-climate

	
Phulai (*Acacia modest*)	Local Keekar (*Vachellia nilotica*)

2. Fauna

The proposed bypass road situated within the forest area which provides habitat of wildlife including Jackals (*Canis aureus*), Wild Boar (*Sus scrofa*), Porcupine (*Erethizon dorsatum*), Partridges (Grey Francolin (*Ortygornis pondicerianus*) and Black Francolin (*Francolinus francolinus*)) and Hare (*Lepus nigricollis).*

No protected area (wildlife sanctury, game reserve, national park etc.) located near the project area. The nearest sensitive site is Tila Jogia game reserve located more than 5km from the project site.

C. Socio-Economic Baseline

1. Languages[7]

Inhabitants of sub-project area speak a variety of dialects such as Punjabi, Saraiki, Raangri, Thalochi, Riyastin and Derawali having a mix culture of Great (North and South) Punjab.

Other Languages include:

- Urdu is mother tongue of few people but being the national language, it is spoken and understood by the sizeable population
- English is also understood and spoken by the educated elite
- Saraiki is mainly spoken by sizeable population in the district
- Baluchi is also spoken by sizeable population in the district

2. Communication and Utilities

Telephone landline facility and mobile network available in the area. Houses are, mostly, connected to the national grid for electricity supply for domestic as well as agricultural use.

3. Means of Transport

Auto Rickshaws are a common mode of transport for short routes within the city. Many of the new rickshaws in the city use Compressed natural gas (CNG) instead of the petrol

[7] https://dporjp.punjabpolice.gov.pk/history

engines as CNG is environmentally clean and cheaper than petrol. Taxis and privately commissioned small passenger carrying vans are available in the area.

4. Social Conflicts

There are no social conflicts reported in the sub-project area by local community and project stakeholder.

5. Land ownership

Require land for the construction of proposed road is under possession of Forest Department except 0.5km length of the road which falls in privately owned land and will be acquired as per Land Acquisition Act, 1894, Section 4. Approximately 1.58Km length of the road located in the hilly terrain and rock cutting will require for the construction activities. Two bridges of 700 ft. length also included in the proposed work scheme. Co-ordinates of start (northern end of the road) and end point (southern end of the road) of the proposed bypass road are 32.9731649N, 73.5850451E and 32.9603185N, 73.5735703E respectively.

CHAPTER - 4: IMPACT ASSESSMENT AND MITIGATION MEASURES

This section provides the analysis of the potential impact during preconstruction/design, construction and operational phases of the proposed sub-project on the physical, biological and socio-economic environment of the sub-project area. The impacts associated with these activities are water/groundwater contamination; solid waste management; air quality issues, primarily related to dust generation, noise, and occupational safety of labour, and community risks etc.

A. Potential Environmental Impacts and Mitigation Measures – Design Phase

1. Site Selection

Different road alignments were considered for the proposed bypass road. The option which have minimum adverse environmental & social impacts were selected for execution. No-project option was ruled out because of the present unacceptable risk of sustainability and deterioration of the heritage site i.e. Rohtas Fort.

Potential Impact

Potential negative impacts of the project mainly related with construction activities i.e. noise & dust pollution, risk of damaging existing environmental resources of the area e.g. surface water bodies, vegetation of the area, groundwater etc. about 20 kanal of private land will also need to be acquired for the project. Potential impacts will be mitigated through implementation of project specific ESMP during construction phase of the project. Land acquisition impacts will be mitigated by preparing and implementing of approved LARP before commence work on site. Compensation will be paid to the project's affectees and documentation record will be shared with the World Bank.

The project will have significant positive environmental and social impacts. Major anticipated positive impacts include reduction in traffic congestion and subsequently reduction in air pollution and accidental damage to the structural elements of the fort, provide smooth connectivity to 80 villages and industrial units (quarries, mines etc.), job opportunities for local community etc.

2. Identification of Site for Construction, Camps, Asphalt and Batching Plant

Potential Impact

- Tree cutting/clearance of land from natural vegetation may involve for establishing contractor's facilities on site including contractor's camp site, asphalt and batching plant site, access road etc.

Mitigation Measures

- Sub-project duration is approx. 18 months. Site(s) for developing contractor's facilities (batching plant, site offices, material and plant & equipment yard etc.) should be carefully selected with the consensus of the supervision consultant and ensure there are minimum environmental and social impacts associated to these activities. Waste land should be preferred on agricultural land. Compensation will be paid to the land owner by the contractor in form of the agreed rent value of the land and/or loss of agricultural product or any economic loss. For permanent land acquisition, Abbreviated Resettlement Action Plan will be prepared according to WB OP 4.12.

B. Potential Environmental Impacts and Mitigation Measures – Construction Phase

I. Physical Parameters

1) Soil Degradation

Impacts-The construction phase activities may result in degradation of soil. This may be caused due to soil erosion during the construction due to uncontrolled run-off from equipment washing yards, excavation of earth/cutting operations and clearing of vegetation.

Unauthorized use of borrow areas and quarries may also cause soil erosion and degradation of landscape.

Mitigation Measures

- Careful use of machinery and equipment should be ensured to prevent leakages which may result in the release of contaminants directly onto the soil.
- Ensure that the machinery should be kept away from exposed soil area and should be repaired on an immediate basis at designated workshops having impermeable floors.
- Removal of vegetation and trees will be avoided to the extent possible.
- The exposed soil will be re-vegetated quickly and compensatory plantation will be followed, i.e. 10 trees to be planted for every tree cut for the project execution in the vicinity of the project area. Illustrated Tree Plantation Plan has been developed and attached as an Annexure B, supervision consultant will finalise the plantation plan with the collaboration of Punjab Forest Department.
- Provide impervious platforms in maintenance yards and storage areas with oil and grease traps for collection of spillages during storage of liquid fuel and lubes, and equipment and vehicle maintenance.
- Contractors to follow proper handling and disposal of construction waste and materials in designated site.
- The contractor will ensure prevention of soil erosion and destabilization by applying batched excavation technique. Topsoil should be protected and re-spread after levelling the excavated area (as far as possible) for developing the site for agricultural purpose.
- Productive land or land adjacent to agricultural/irrigated land should be avoided to use it as borrow area. Contractor must prepare borrow area management plan and gets its approval from the supervision consultant before commence excavation on site. The borrow area management plan should provide the restoration plan of borrow areas and address health and safety issues related to the activities.

2) Air Quality

Impacts – The machinery, equipment, diesel generators, operation of batching plant and sub-project vehicles will be used for movement of people and construction activities such as excavation, levelling, filling of earth material, ground compaction etc. Due to these activities release of exhaust emissions, containing carbon monoxide (CO), sulphur dioxide (SO_2), oxides of nitrogen (NO_X), and particulate matter (PM) is expected, which can deteriorate the ambient air quality in the sub-project site and access roads/site setup. Furthermore, vehicular movement on unpaved tracks or *katcha* routes may also cause fugitive dust emissions.

Mitigation Measures

- All vehicles, machinery, equipment and generators used during construction activities should be kept in good working condition and be properly tuned and maintained to minimize exhaust emissions.
- Open burning of solid waste from the Contractor's camps should be strictly banned
- Stockpiled materials will be covered to avoid dust/particulate emission.
- Adoption of preventive measures against dust such as regular water sprinkling of the site including service roads and excavation sites.
- Near cultivation fields or dust prone area the speed of the vehicles will be limited to 20 km/h to avoid excessive dust emissions.
- The exhaust emissions will comply with the N/PEQS.
- The contractor shall be required to minimize the double handling of material during earthworks operations for the road construction work.
- The contractor shall be prohibited from vegetation clearance without prior approval of supervision consultant.
- Water sprinkling shall be carried out at material stockpiles where dust is generated.
- Materials delivered to sites, such as cement, loose material, sand or aggregates shall be transported in a covered truck.
- Burning of waste oil should be strictly prohibited.

3) Noise and Vibrations

Impacts – During construction, use of heavy machinery such as bulldozers, excavators, stabilizers, concrete mixing plant, etc. can result in noise pollution and vibrations, causing discomfort and health hazards to workers, surrounding community and structures (archaeological sites, buildings, bridges etc.).

Mitigation Measures

- Use of modern and well-maintained vehicles and machinery with reduced noise emission levels; confining excessively noisy work to normal working hours (8am-5pm) in the day.
- Providing construction workers with suitable hearing protection such as earmuffs and train them in their use.
- Locating the concrete mixing, and materials shipment yards at least 500m from residential areas.
- The contractor shall keep in place any acoustic guards, covers, and doors provided on plant, generators, and vehicles and maintain all in accordance with the manufacturer's maintenance procedures to ensure good working order.
- Pressure horns will not be allowed while passing through or near communities in the sub-project area.
- The contractor shall train the operators of construction equipment on potential noise problems and the techniques to minimize noise levels. All working activities will be restricted within the allowed working hours. Working hours should be formally informed to the local community and make adjustment if require in light of the feedback from the community members.
- No construction activities should carry out within 200 feet of the archaeological site to avoid any vibration damages to the historical structures.
- Contractor should use appropriate machinery and plant to have minimum vibration impact to the surrounding environment.

4) Surface and Groundwater

Impacts – The construction residue and debris, if not handled and stored properly may result in groundwater contamination. However, Kahan River and Naalah Ghaan are located nearby project site. The nearest location of main creek of Kahan River is from the western boundary wall of the fort i.e. about 200m, while Naalah Ghaan flows along eastern boundary of the fort (about 50 from the boundary wall). Land erosion and sedimentation impact is not envisaged due to thick vegetation of the area. New plantation will be carried out along the new bypass road, once the construction activities are completed.

The proposed bypass road located at east of the fort. Two road bridges are proposed at the crossing of Naalah Ghaan as shown on environment map (figure ..). The nearest location of Kahan River from the proposed bypass road is about 100m. It is envisaging that the surface water will be impacted if no proper mitigation measures are taken while the impact on groundwater at the sub-project site may become significant.

Mitigation Measures

- Ensure that all liquid raw materials such as oil, lubricants, and chemicals at all proposed sub-project sites are stored within the storage yard with impermeable floor and additional catchment arrangement for any accidental spillage or leakage.
- Water required for construction should be obtained in a way so that water availability and supply to nearby communities remains unaffected.
- The contractor will obtain all necessary permits for the Local Authority related to water consumption.
- Regular water quality monitoring according to a determined sampling schedule and environmental monitoring plan.

- The contractor will ensure that construction debris does not find its way into the drainage or irrigation canals, wastes from the construction sites will not be released to nearby water sources, cultivation fields, irrigation channels which may get clogged.
- Prohibit washing of machinery and vehicles near surface water sources, provide sealed washing basins and collect wastewater in sedimentation/retention pond.
- The contractor shall submit a plan for managing wastewater generate from the project activities using underground conveying system connected with septic tank and soaking pit etc. if the existing sewage system available to connect then get approval from local relevant authority, PMU and supervision consultant. The plan must include designs or specifications demonstrating that the treatment rate of the system exceeds the loading rate, maintenance of the system, proposal for treatment and disposal of sludge from septic tanks.

5) Waste Disposal

Impacts – The main types of waste expected to be generated and requiring disposal include:

- Fuel, oils, and chemicals;
- Sewage;
- Campsite waste;
- Medical waste;
- Demolition waste;
- Packing waste; and,
- Excess construction material.

Construction activities can result in the generation of wastewater, oil spillage from machinery, domestic waste etc. Improper solid waste disposal can result in increased air pollution through burning of waste, vector borne diseases, and contamination of water sources of the area.

The construction activities are not perceived to result in the production of any hazardous waste. As the sub-project deals with the construction of civic facilities, no blasting is perceived nor is use of hazardous substances anticipated during the construction waste.

Mitigation Measures

- Contractor should prepare a detailed Solid Waste Management Plan for the construction phase of the project (including adequate placement of waste bins, requirements of sanitary staff, transportation of waste, and identification designated site for final disposal or make arrangements of periodic collection of waste from the site with local authority i.e. TMA).
- Do not allow sitting and location of worker camps, including waste dump sites, in a distance closer than one kilometre to any inhabited areas and historic site.
- Plan for placement of waste collection containers throughout the sub-project area.
- Disallow the burning of any of type of waste.
- Prepare plans for the safe handling, storage and disposal of harmful materials.
- Implement resource conservation, and encourage staff (through training) to reduce waste, reuse waste and recycle waste wherever possible.
- Collect all bio-degradable domestic waste and dispose of at the designated area as defined by TMA.
- Do not burn materials which may lead to the release of toxic or hazardous substances (PEQS).
- Sell recyclable waste to local vendors.
- Collect non-biodegradable waste separately and dispose of at designated waste disposal area.
- Enforce the use of garbage bins and prevent littering of the site.
- No fire is allowed in open.
- Do not burn materials such as plastics and polyethylene which may lead to the release of toxic or hazardous substances.
- Collect and dispose of the waste in municipal waste dumping points.
- Waste will be collected and disposed of in municipal waste dumping points.

- Reduce construction waste by reusing waste as a fill material (prior to testing to confirm the suitability of material).
- Collect construction waste separately to domestic waste.
- Collect and remove all construction waste from the sub-project area.
- Reuse material as fill material (where possible) or sell to local vendors.
- Treat construction wastes water and dispose of after necessary treatment.
- Do not burn materials which may lead to the release of toxic or hazardous substances.
- Request suppliers to minimize packaging where practical.
- All the medical waste shall be disposed of in burial pits or incinerated with other local hospital waste.
- The burial site shall be identified away from community residents and sub-project area. The burial site shall be identified on the barren land with due coordination of TMA.
- Hazardous or special waste (used batteries, empty container of chemicals etc.) should handover to specialized and certified disposal contractor.
- Effluent from contractor's workshop and equipment washing yards would be passed through gravel/sand beds to remove oil and grease contaminants or other necessary treatment before discharging it into nearby surface water bodies or utilize for agricultural purposes.
- Training of workers will be carried out in the storage and handling of materials and chemicals that can potentially cause soil contamination.
- Proper labelling of containers will be carried out, including the identification and quantity of the contents, hazard contact information etc.
- Contractor should furnish an Emergency Response Plan should be prepared to address the accidental spillage of fuels and hazardous goods at storage areas.

6) Physical Cultural Resources

Impacts – Rohtas Fort is a popular tourist place. Domestic and foreign tourists visit the site during whole year. Gurdwara Chowa Sahib located just outside the northwest boundary of the fort. However, the gurdwara is well away from the proposed bypass road (> 1km). Sikh community visit the gurdwara during their annual events e.g. Vaisakhi in March/April and Guru Nanik birth (Guru Nanik Gurpurab) in November every year. There may be some negative impacts due to air and noise pollution, and vibrations due to movement of heavy vehicles and use of heavy machinery.

Mitigation Measures

- The most important single strategy for protection is site avoidance: redirecting activities so that they do not endanger a site by limiting noise and air pollution while working close to the ancient sites. Any development or physical activity should be at least 200 feet away from the sites.
- Suggestion of the local communities and the concerned authorities will be suitably incorporated in the preventive measures to conserve the antique, artefact and cultural properties.
- Implement Chance Find Procedure (provided as Annex-F) in case of uncovering of ancient site or artefacts during construction phase of the project. Explain Chance Find Procedure to the site workers by delivering toolbox talk on this topic during construction phase of the project on site.

II. Biological Parameters

1) Flora

Impacts: Local flora is important to provide shelters for the fauna, offer fruits/or timber/fire wood and protect soil erosion. The alignment of proposed bypass road is confirmed and total number of trees located within the ROW and need to be uprooted for the proposed bypass road has been calculated by Forest Department (copy attached as an Annex-B). It is envisaged to uproot 149 mature trees and 1107 Pole Crop. As a precautionary principle, the following mitigation measures have been proposed:

Mitigation Measures

- Planting of minimum ten trees for every tree cut during construction[8].
- Do not introduce invasive or exotic species through plantation.
- Measures to prevent soil and water contamination will forestall any adverse impact on the faunal diversity of the area.
- Contractor shall prepare a conservation plan to avoid any impact on fauna during construction.
- Sites for developing contractor's facilities should be carefully selected with the consensus of supervision consultant such that there is no or minimum tree cutting required.

2) Fauna

Impacts: There is no sensitive wildlife habitat near project site as per wildlife, forest and fishery department, nearest wildlife sensitive sites including Chumbi surla chakwal Jhelum and Jalapur Sharif are at 200 Km and 100 Km distance respectively. Therefore it can be concluded that there are no direct or indirect harmful impacts on wildlife of the area due to the project execution. There are no wetlands, or any other type of natural habitat to support critical mammal or bird species identified within the project area. There might be a risk to key ground nesting birds, which could be struck during works throughout the nesting season. It is anticipated that the birds shall move to the available similar area in the surrounding of the project area during construction phase of the project.

Mitigation Measures

- On identification of any nest, the contractor will immediately cease works in the area and inform the Engineer and PMU. The contractor will also erect a fence within 50ft of the nest and prohibit any works within this area until approved by the Engineer.
- The contractor's staff will be required to sign a code of conduct prohibiting hunting, poaching or trapping of animals.
- Provide adequate knowledge to the workers regarding protection of fauna, set punishments for illegal poaching/hunting.
- Planting of minimum ten new trees for every tree cut during construction for the project activities.

III. Socio-Economic Parameters

1) Land Acquisition, Resettlement, Loss of Livelihood

Impacts – Construction of this sub-project will require land acquisition.

Mitigation Measures

Construction of road involved land acquisition, about 20 kanal of private land will be acquired for the proposed by-pass road. There are no households residing within ROW of the proposed road, therefore there will be no physical displacement of households. Since, the number of owners of the said land as per Land Record are less than 200, an Abbreviated Resettlement Action Plan (ARAP) will be prepared for mitigation and compensation of the project affecties.

2) Impact on Livelihood and Economy

Impact - The proposed sub-project will provide job opportunities for locals during the duration of the civil works where very low to low-income communities are living. Hence, the sub-project activities will enhance employment and business opportunities for the locals, the impact on livelihood is assessed to be positive in terms of increased employment opportunities and better livelihood. It is estimated up to 100 labourers will be required for carrying out construction activities. Out of the total, 75% of labourers will be from local community.

3) Workers Health and Safety

Impacts - The construction phase will include various activities such as; earthworks activities, installation of a batching plant, movement of various heavy machines and manual handling. During loading-unloading operation, bad management, improper storage of hazardous materials, (i.e. petrol, admixtures, etc.), could result in adverse effects on the health and safety of staff as well as on the environment and nearby community. There may also be an issue of hiring under-age labour during construction.

Mitigation Measures

- Train all construction workers in basic sanitation and health care issues (HIV/AIDS, COVID-19).
- Prepare a Worker Health and Safety Plan for the construction phase covering documentation and reporting of occupational accidents, diseases and incidents with complete record for supply of personal protective equipment for all staffs and visitors.
- Identification of potential hazards to workers, particularly those that may be life threatening.
- Ensure health care facilities especially first aid facilities are readily available. Appropriately equipped first-aid stations should be easily accessible throughout the sub-project area.
- Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE.
- Document and report occupational accidents, diseases, and incidents.
- Provide awareness to the construction drivers to strictly follow the driving rules.
- Safe storage facilities for petroleum and other chemicals at sub-project site.
- The contractor should provide drinking water facilities to the construction workers at all the construction sites.
- Ensuring that children and minors are not employed directly or indirectly on the sub-project.
- Children of less than 14 years of age and pregnant women or women who delivered a child within 8 preceding weeks should be dealt in accordance with the Pakistani Labour Laws and Employment of Child Act (1977).
- A site based Grievance Redress Mechanism (GRM) will be operational during the construction phase of the project.

4) Public Health and Safety

Impacts – Construction activities and movement of heavy vehicles at construction sites and service roads may result in road-side accidents, particularly with the local community who may not be familiar with the presence of heavy equipment. The following good practice should be considered:

Mitigation Measures

- It is estimated up to 100 labourers will be required for carrying out construction activities. Out of the total, 75% of labourers will be local residents and will return to their homes at night, while 25% (skilled) will have overnight stay. Accommodation for site based project's staff will be rented out nearby the project site as per requirement rather than developing a labour camp.
- Train drivers operating heavy vehicles in road and pedestrian safety.
- Set appropriate speed limits to avoid accidents.
- Placement of construction signage, particularly at populated area.

C. Potential Environmental Impacts and Mitigation Measures – Post Construction Phase

1) Changes in Land Value

Proposed sub-project is expected to increase the land values, where little or no road infrastructure is present. Land owners will have an opportunity to sell their land on increased prices. This will be major positive impact.

2) Restoration of original site

Impacts - Disposal of contaminated construction wastes and left-over construction material can lead to soil contamination. All areas temporarily obtain by the contractor for contractor's facilities and borrow area need to be restored at completion of the work. Poorly restored sites may case adverse social and environmental impacts including contamination of soil, water resources, financial implication on land owners, health & safety issues etc.

Mitigation Measures

- Contractor is bound to restore the site back to its minimum original or better conditions before handing over.
- All areas temporarily possessed by the contractor for contractor's facilities (batching plant site, plant & equipment yard, site offices etc.) should be restored to minimum original condition of the area before possessed by the contractor.
- Borrow areas restoration plan should be prepared and implement on site under supervision of the consultant.
- The contractor will not leave the borrow pits in an unusable condition such that it could be filled with rain water and cause problems for the community e.g. breeding place for mosquitoes etc.
- Barren or unfertile land will be preferred for use as a borrowing area than agricultural land.

  If the agricultural land needs to be used as a borrow area then the following additional measures will be undertaken by the contractor:
    - Remove of the topsoil and store on a separate site for its re-spread back on the leveled borrow area of the topsoil and store on a separate site for its re-spread back on the leveled borrow area
    - Excavate up to maximum of 3 feet
    - Level slops as far as possible
    - Place the topsoil back on reasonably leveled area

3) Air and Noise Pollution

Impacts -Construction of new road, in the longer run, increased traffic levels and congestion will lead to PM10 pollution levels which may result in causing public health risks, nuisance and other impacts on bio-physical environment. This impact is permanent and positive, in case of improvement of road conditions and minor negative, when traffic volume is increased.

Noise pollution should be controlled during construction activities carry out near the sensitive receptor e.g. schools, hospital living areas etc.

Mitigation Measures

- Setting up of a system to monitor air quality along sub-project area in accordance with the applicable standards/limits.
- Roadside tree plantations as applicable and feasible under harsh climatic conditions, plants should be selected in accordance to their ability to absorb emissions.
- Regular road maintenance to ensure good surface condition.
- Suitable equipment and plant will be used in execution of the work to minimize noise pollution.
- All vehicles, machinery, equipment and generators used during construction activities will be kept in good working conditions and will be properly tuned and maintained in order to minimize noise pollution, exhaust emission and minimum land disturbance.
- All working activities will be restricted within the allowed working hours. Working hours should be informed formally with the stakeholders through consultation and amend working hours if rquire.
- The maximum speed limit of 20km/h will be enforced for vehicles using the embankments and access road
- Noise level should be monitored on a regular basis and levels should be maintained within the NEQS level, near the sensitive receptors e.g. schools, hospital, living area etc. Use noise absorption panels around the work area if require. Frequent noise monitoring is

recommended – hourly basis at the start of the work activities for first 2 days of the work, after which the monitoring interval could increase to daily basis.

4) Soil

Impacts - Disposal of construction waste or leakage/accidental spill of liquid material or wastewater or contaminated surface run-off from sub-project site(s) can lead to soil contamination.
Unplanned excavation and poor restoration of the borrow areas may trigger soil erosion and adversely impact on land agricultural productivity.

Mitigation Measures

- Ensuring that contractor has properly disposed of all remaining waste including left over material and hazardous waste.
- Implementing good house-keeping practices, such as the sorting and placing of loose construction materials or demolition debris in established areas away from foot paths.
- Cleaning up excessive waste debris and liquid spills regularly.
- Restore borrow areas by levelling the area as far as possible and re-spread saved topsoil on restored area to maintain land agricultural productivity or encourage vegetation growth, this will minimize risk of soil erosion.
- All backfilled area should be properly compacted to the satisfaction of the supervision consultant for avoiding land erosion and health & safety problems.

5) Biodiversity Conservation

Tree cutting will be required for the construction of proposed bypass road. It is envisaged that 149 mature trees and 1107 pole crop fall within ROW of the proposed new road and need to be uprooted. No negative impacts are envisaged on the flora of the area during the operational phase. However, improper maintenance of the saplings planted against the trees cut for the proposed sub-project may adversely affect the growth of those saplings which were planted to improve the environmental aesthetics of the sub-project area.

The natural habitat is vulnerable to the noise and dust generated from the movement of site traffic and work activities during the construction phase. Presence of adequate flora will absorb CO_2 gas, through photosynthesis, emitted from an expected large number of cars, vehicles and public transport, thus purifying air of hazardous particles.

Mitigation measure

- Select the locations for site offices and other contractor's facilities e.g. batching plant, material yard etc. such that no/minimum tree cutting is required.
- The boundary of the contractor's facilities will be fenced or walled to keep contractor's activities inside the allocated area only.
- It is the contractor's obligation to ensure that no unnecessary and out of bound activities/movements carried out by the project's staff on site.
- No fire arms will be carried by any of the workers.
- All forest, wildlife and fisheries laws will be fully respected and abided by the contractor and his work force.
- Necessary sign boards will be displayed to remind the laborers, visitors and members of public of their obligations towards natural habitat.
- Inspections by wildlife, forest and fisheries officers will be facilitated at work site, if require, to facilitate the proper implementation of relevant laws.
- 24 hours security will be provided by the contractor at the contractor's facilities.
- Every tree cut on site for the execution of work will be replaced with the plantation of a minimum of ten new trees. Therefore minimum 12,560 new trees will be planted in the vicinity of the project with the consultation of Punjab Forest Department.

- All vehicles, machinery, equipment and generators used during construction activities will be kept in good working condition and be properly tuned to reduce noise, exhaust and land disturbance.
- No unauthorized tree or bush cutting will be allowed. Should it be necessary, it must not be done without the permission of the supervision consultant.
- If possible, the nests of birds on trees that need to be uprooted will be shifted to other nearby trees.
- Invasive species of trees shall be strictly avoided.

CHAPTER - 5: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

An Environmental Management and Monitoring Plan (EMMP) includes description of mitigation measures necessary to minimize or offset adverse impacts and to enhance beneficial impacts.

This section deals with the identification of potential negative impacts and proposes mitigation measures as shown in Table 5.1 while Environmental Analysis, Environmental Monitoring Plan and ESMP implementation cost is given in the Table 5.2, 5.3 and 9.1 respectively.

Sub-project	"Construction of Rohtas Fort Bypass Road Length= 3.21Km District Jhelum"

Table 5-1: ENVIRONMENT MANAGEMENT AND MONITORING PLAN

Proposed Sub-project Activities	Potential Impacts[9]	Mitigation Measures	Implementing Agency	Monitoring Responsibility
A. Design Phase				
Site Selection	• Land Acquisition/Resettlement issues of local people • Tree cutting	• Sub-project involves construction of road. In case of loss to properties or land acquisition, compensation will be paid to all concerned affecters' as per World Bank Policy of 4.12. • The exposed soil will be re-vegetated quickly and a compensatory plantation will be followed, i.e. 10 trees to be planted for every tree cut. Removal of vegetation and trees will be avoided to the extent possible.	Contractor	Supervision Consultant and PTEGP
Identification of site for site offices, plant & equipment yard and , asphalt and batching plant	• Tree cutting may involve the construction of site offices, asphalt and batching plant site etc. • Land Acquisition Issues	• Asphalt, batching and crushing plants must be installed in the downwind direction of residential area. • Contractor's facilities should be developed on state land with the approval of supervision consultant and PTEGP. However, If private land is the most suitable option than compensation/land rent value should be paid to the land owner as per Land Acquisition Act, 1894 and WB OP 4.12.	Contractor	Supervision Consultant and PTEGP
B. CONSTRUCTION PHASE				

[9] The impact of an activity is a change from the baseline situation that is caused by the activity.

Handling of waste	**a)Environmental Issues:** • Unplanned disposal of construction and food waste may affect visual and aesthetic environment and provide breeding place for pests and mosquitoes. • Dust, noise, polluted emission and vibration issues may generate during construction of road, posing health issues on labours. **b) Social Issues:** Heaps of solid waste may cause disturbance and nuisance to local community.	• Waste will be properly disposed of by provision of rubbish bins and/or suitable temporary waste storage area. Arrange periodic waste collection with local authority for disposal of the waste. • Updated and tuned machinery will be used to control noise. • Water sprinkling will be carried out on regular basis during dry and warm weather. • Dust masks and ear plugs should be provided to the labours. • Bitumen waste should be stored in closed containers and placed in a fenced storage area with paved floor. The waste should be properly disposed by collecting and carrying to the approved disposal site by Supervision Consultant and PTEGP to avoid land or water contamination. • Availability of bins will be ensured for commonly generated solid waste. • Timely management of solid waste will be ensured, and contractor would be asked to take services of TMA[10] for proper sanitation.	Contractor	Supervision Consultant and PTEGP
Handling of construction material	**a) Environmental Issues:** • Construction material such as sand, and bitumen may pose health risks. • Spray of bitumen may cause respiratory and visual impairment.	• Material shall be appropriately covered to prevent dispersal with air or water. • Implement dust suppression measures for all stockpiles. • Protective health and safety measures should be adopted including provision of designated walking track, use PPE etc. • Concrete mixing on the ground shall not be allowed.	Contractor	Supervision Consultant and PTEGP

[10] Tehsil Municipal Authority

	• Emissions and runoff of cement- contaminated water from batching plant may pollute the nearby water sources or productive land.	• Emissions from batching plant should be properly controlled and runoff contaminated water should be collected, stored and disposed of at the designated site.		
C. GENERAL ENVIRONMENTAL ISSUES				
Air Quality	• Dust emissions may generate during construction activity. • Dust plumes from construction operations such as, earthworks (dismantling, grading, shaping), haulage and dumping of soil have always generated excessive dust possibly lead to short-term respiratory health effects (coughs). • Due to heavy movement of vehicles, noise may generate. • Polluted emissions may generate due to fuel burning from machinery/equipment.	• Wet suppress or cover transported materials that may emit dust during transportation. • All vehicles, machinery, equipment and generators used during construction activities should be kept in good working condition and be properly tuned and maintained to minimize exhaust emissions. • Open burning of solid waste from the contractor's camps should be strictly banned. • Asphalt, hot mix and batching plants should be equipped with dust control equipment such as fabric filters or wet scrubbers to reduce level of dust emissions. • Stockpiled materials will be covered to avoid dust/particulate pollution. • Air quality analysis will be carried out before, during and after construction.	Contractor	Supervision Consultant and PTEGP
Noise pollution	During construction, use of heavy machinery such as bulldozers, excavators,	• Use of modern and well- maintained vehicles and machinery with reduced noise emission levels.	Contractor	ES Supervision Consultant and PTEGP

	stabilizers, concrete mixing plant, pneumatic drills, stone crushers asphalt plants etc. can result in noise pollution and vibrations, causing discomfort and health hazards to workers and local community.	• Confining excessively noisy work to normal working hours in the day. • Providing construction workers with suitable hearing protection such as earmuffs and training them in their use. • Heavy machinery like percussion hammers and pneumatic drills should be used at a minimum level and should not be used at all during the night. • Locating the rock crushing, concrete mixing, and materials shipment yards at least 500m from residential areas.		
Soil	Soil erosion may occur due to uncontrolled run-off from equipment washing yards, earthworks and clearing of vegetation.	• Removal of vegetation and trees will be avoided as much as possible. • The exposed soil will be re-vegetated quickly and compensatory plantation will be followed, i.e. 10 trees to be planted for every tree cut on site/ in the vicinity of the sub-project . • Provide impervious platforms in maintenance yards and storage areas with oil and grease traps for collection of spillages during storage of liquid fuel and lubes, and equipment and vehicle maintenance. • Controlled disposal of oil, grease and chemicals, and restoration of site back to its original condition before handing over. • Contractors to follow proper handling and disposal of construction waste and materials at the designated site. • The contractor will ensure prevention of soil erosion and destabilization by applying batched excavation technique. • Productive land or land adjacent to agricultural/irrigated land may not be used for excavation/borrow area.	Contractor	Supervision Consultant and PTEGP

Vibration	• Shock waves can be produced due to the use of heavy machinery. • It may create disturbance for nearby community or trigger land sliding.	Use of vibratory rollers should be avoided, if require than the use of the vibrator should be technically evaluated and ensure there is no unacceptable risk of adverse impact on the environment and historical buildings of the area.	Contractor	Supervision Consultant and PTEGP
Surface and Groundwater	• Construction waste and oil spills, if left unattended will result in forming leachate that will percolate through the soil strata and may contaminate the groundwater. Wastewater from sanitation facilities provided on site may also result in contamination of groundwater sources of the area i.e. hand pumps or tube wells (two most common type of groundwater sources in the area). • Contaminated surface run-off may contaminate surface water bodies of the area.	• Proper disposal of solid waste at the designated site to sustain the water and land quality for domestic requirements. • Water required for construction should be obtained in a way so that water availability and supply to nearby communities remains unaffected. • Contractor will ensure that construction debris does not find its way into the drainage or irrigation channels or water streams of the area which may get clogged and contaminated. • Prohibit washing of machinery and vehicles in near surface water bodies, provide sealed washing basins and collect wastewater in sedimentation/retention pond. • Construction work/material storage (liquid or solid) close to streams or other water bodies will be avoided. Liquid material or fuel should be kept on site in the designated bunded area (impermeable hard surface with raised sides) to minimise the risk of escape of contamination to the surrounding environment. • Latrines at sites must be located at least 50 meters from any sources of groundwater such as hand pumps and wells. • Contractor will conduct the mandatory water testing and obtain all necessary permits as per regulations from the Local Authority.	Contractor	Supervision Consultant and PTEGP

Waste Disposal	Construction activities can result in the generation of wastewater, accidental oil spillage from machinery, domestic waste from site offices and rented houses for site based staff and construction related solid waste.	• Prepare a detailed Solid Waste Management Plan for the construction site (including adequate placement of waste bins, requirements of sanitary staff, transportation of waste, and identification designated site for final disposal or arrange disposal with local authority i.e. TMA). • Plan for placement of waste collection containers throughout the sub-project area. • Disallow the burning of any of type of waste. • Prepare plans for the safe handling, storage and disposal of harmful materials. • Implement resource conservation and encourage staff (through training) to reduce waste, reuse waste and recycle waste wherever possible. • All COVID-19 waste such as, gloves, face mask, tissue papers shall be disposed-off in separate top covered waste bins in different identified areas as per contractor waste management and disposal plan. These waste bins shall be marked with COVID-19 waste· • Collect all bio-degradable domestic waste and dispose of at the designated area as defined by TMA. • Do not burn materials which may lead to the release of toxic or hazardous substances (see PEQS). • Sell recyclable waste to local vendors. • Enforce the use of garbage bins and prevent littering of the site. • No fire is allowed in open. • Do not burn materials such as plastics and polyethylene which may lead to the release of toxic or hazardous substances.	Contractor	Supervision Consultant and PTEGP

		• Reduce construction waste by reusing waste as a fill material (prior to testing to confirm the suitability of material). • Collect construction waste separately to domestic waste. • Collect and remove all construction waste from the sub-project area. • Reuse waste material or construction waste as fill material or sell to local vendors, if possible. • Treat construction wastes water and dispose of after treatment. • Do not burn materials which may lead to the release of toxic or hazardous substances. • Request suppliers to minimize packaging where practical. • Burning materials which may lead to the release of toxic or hazardous substances should be strictly prohibited. • All the medical waste shall be disposed of in burial pits. • The waste burial site shall be identified away from community residents and sub-project area. The burial site shall be identified on the barren land with due coordination of TMA. • Hazardous waste should handover to specialized and certified disposal contractor. • Effluent from contractor's workshop and equipment washing yards would be passed through gravel/sand beds to remove oil and grease contaminants and/or other require treatment before discharging it into nearby water streams, groundwater, canal or agricultural land. • Training of workers will be carried out in the storage and handling of materials and chemicals that can potentially cause soil contamination.		

		• Proper labelling of containers will be carried out, including the identification and quantity of the contents, hazard contact information etc.		
Emergency Response Plan	Uncontrolled releases of hazardous materials may result from small cumulative events, or from more significant equipment failure associated with events such as manual or mechanical transfer between storage systems or process equipment.	• Measures for fire prevention and fire fighting. • Indicators on site (for example, heavy rainfall) that will prompt the shutdown of specified areas of work. • Provide procedure for shutdown of site, including transfer of plant, materials and personnel to safe areas (for example in the event of a flood). • Prepare emergency evacuation procedure for staff and members of the public likely to be impacted by an emergency event on site (for example: fire or blast). • Where practicable, avoiding or minimizing the use of hazardous materials. • Emergency lighting of adequate intensity should be installed and automatically activated upon failure of the principal artificial light source to ensure safe shut-down, evacuation etc. • The contractor will prepare emergency shutdown procedures and evacuations to cover all staffs and affected members of the public in the event of any emergency incident (such as traffic accident and fire). The contractor will ensure emergency access routes are well-known and have appropriate signage. • Identification of locations of hazardous materials and associated activities on an emergency plan. • Training should incorporate information from Material Safety Data Sheets for hazardous	Contractor	Supervision Consultant and PTEGP

		materials being handled. MSDSs should be readily accessible to employees in their local language.		
Biodiversity (Fauna and Flora)	Cutting of approximately 1256 trees will take place. There might be a risk to key ground nesting birds which could accidently be harmed during works throughout the nesting season.	• Conduct walk over survey before clearing the vegetation of the area for project activities. If birds nest identified, the nest(s) should be physically relocated to safe area before construction machinery approaches and cutting of trees. • Planting of ten trees for every tree cut on site for the project execution. • Contractor shall prepare a conservation plan to avoid any impact on fauna during construction. • On identification of any nest, the contractor will immediately cease works in the area and inform the Engineer and PMU. The contractor will also erect a fence within 50ft of the nest and prohibit any works within this area until approved by the Engineer. • The contractor's staff will be required to sign a code of conduct prohibiting hunting, poaching or trapping. • Provide adequate knowledge to the workers regarding protection of fauna, punishments for illegal poaching. • Speed limit will be defined for minimal impacts on fauna.	Contractor	Supervision Consultant and PTEGP
Health and Safety Measures	• Health problems or immediate risk may emerge at dismantling and construction phase e.g. at time of bitumen plant/asphalt handling	• Providing basic medical service and supplies to workers on-site (First Aid Boxes). • Setting and enforcement of speed limits. • Prepare and implement traffic management plan, including safety of pedestrians, taking special care of school children.	Contractor	Supervision Consultant and PTEGP

	• Road safety and accident risks • Dust pollution • Air and Noise pollution • Un-awareness regarding usage of PPEs may have serious outcomes	• Do not allow untrained workers to operate machinery and heavy vehicles. • Provision of appropriate and high quality PPEs to workers such as gloves, vests, hard-hats, masks etc. • Protection devices (ear muffs) will be provided to the workers operating in the vicinity of high noise generating machines. • Provision of protective clothing for labourers handling hazardous materials, e.g. helmet, adequate footwear for bituminous pavement works, protective goggles, gloves etc. • Provision of proper safety signage at sensitive/accident-prone spots. • Consecutive sessions would be organized to create awareness among labours. • Arrange awareness sessions on public safety for visitors during special festivals.		
D. GENERAL SOCIAL ISSUES				
Subproject will have positive outcomes for the local communities by provision of new by pass road in the area.				
Job opportunities	It will lead to increase in local employment during execution of the project.	• Priority will be given to local area inhabitants for skilled and unskilled labour jobs. Majority of labour need will be met from the sub-project areas. The sub-project will also require skilled workers, and these may be available from the community. It is anticipated that approximately 75% of the workforce will be from the sub-project area while some 25% of labour (mainly skilled) would be hired from other part of the country. This labour influx may have a positive impact on economy of the area.	Contractor	Supervision Consultant and PTEGP

Construction Camp Management	• Campsites for construction workers are the important locations that have significant impacts such as health and safety hazards on local resources and infrastructure of nearby communities. • There will be a potential for diseases to be transmitted including malaria, exacerbated by inadequate health and safety practices. • Risk of Child labour and school drop out • Poor Health Safety attributes	• Contractor will have rented out houses for the workers rather installation of camps nearby the sub-project site. • Provide adequate health care facilities within construction sites. • Provide first aid facility round the clock. • Maintain stock of medicines in the facility and appoint fulltime designated first aider or nurse. • Ensuring that children and minors are not employed directly or indirectly on the sub-project. • Children of less than 14 years of age and pregnant women or women who delivered a child within 8 preceding weeks should not be employed on site, in accordance with the Pakistani Labour Laws and Employment of Child Act (1977). • Communication on hiring criteria, minimum age, and applicable laws. • Provide personal protection equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty ones and replacing them the damaged ones. - Safety procedures include provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job.	Contractor	Supervision Consultant and PTEGP

Economic Issues	Economic issues may arise due to; • loss of land, • productive plants, • livelihood, • Vendors (Mobile/permanent).	• Land acquisition is involved, prepare ARAP and implement before commence construction phase of the project. • NOC has been obtained from Punjab Forest Department for clearing vegetation of the area for project execution. • No Public structures are found to be affected in the sub-project area • No permanent vendors were observed during social and environmental assessment survey. • In case of any complaint, the focal person of GRC may contact and his contact details will be provided at sub-project site.	Contractor	Supervision Consultant and PTEGP
		E. Physical Cultural Resources		
Excavation Work	It is construction of a new road to provide an alternate route for traffic using the existing fort road which passes through the premises of a heritage site Rohtas Road. Due to the historic nature of the site, there may be some negative impact due to air and noise pollution, and vibrations due to movement of heavy vehicles and use of heavy machinery. Excavation work during construction may result in the uncovering of ancient sites or artefacts.	• All vehicles, machinery, equipment and generators used during construction activities should be kept in good working condition and be properly tuned and maintained to minimize exhaust emissions. • In case of discovery of ancient sites or artefacts during construction, follow the procedure for Chance Finds Procedures (attached as an Annex-F). • SOPs provided as an annexure H for carrying out road rehabilitation work near the heritage site i.e. Rohtas Fort should follow during execution of the work.	Contractor	Supervision Consultant and PTEGP

Table 5-2: Environmental Analysis

Parameter	Details of Action	Monitoring Frequency	Responsibility
Air Quality Testing	Air quality will be analysed through EPD certified lab.	Two times (During and post construction).	Contractor
Noise level Testing	Provide ear plugs/ear muffs to workforce and monitoring noise level on regular basis during carry out noise producing activities.	Noise meter should be available on site for monitoring the noise level daily while carrying out work activities near sensitive receptors (school, hospital etc.).	Contractor
Water testing	Drinking water quality will be analysed through EPD certified lab.	Two times (During and post construction) from existing groundwater source (hand pump or tube-well) near the work area and surface water body (stream, river etc.)	Contractor

Table 5-3: Environmental Monitoring Plan

Environmental monitoring will be carried out to ensure that all construction activities comply and adhere to environmental provisions and standard specifications, so that all mitigation measures are implemented.

Sr. #	Identified environmental and social issues	Monitoring Parameters	Monitoring Site	Monitoring Frequency	Reporting frequency	Responsibility
1.	**Noise and vibration**	• Use of machineries and equipment having less noise. • Provision for personal protective equipment (PPE's), ear muffs/ear plugs to workers. • Noise level testing will be carried through EPD certified Lab.	Sub-project Working Area	Noise meter should be available on site and monitor noise level during execution of noise producing activities on regular basis (once in per working shift during noise producing activities). The monitoring frequency can be extended to monthly basis with the provision of supervision consultant. Laboratory based noise	It will be conducted before[11] and during construction activities. The noise monitoring data should be provided in the monthly progress report prepare and submit by the supervision consultant.	Contractor

[11] Pre-construction analysis is already incorporated in report.

Sr. #	Identified environmental and social issues	Monitoring Parameters	Monitoring Site	Monitoring Frequency	Reporting frequency	Responsibility
				monitoring should be completed on quarterly basis.		
2.	**Dust**	• Provision for personal protective equipment (PPE's) Mask. • Avoiding construction activities during nights. • Sprinkling of water and removal of excess matter/construction debris from the site as soon as possible.		Minimum one time water Sprinkling on daily basis during summer and on when required basis during winter	It will be conducted during execution of civil work. In this regard, an environmental compliance report based on checklist will be submitted.	Contractor
3.	**Air Quality**	• Air quality will be analysed through EPD ***certified Lab.	Sub-project Site	Two times	It will be conducted before[12], during and after completion of civil work. In this regard, an environmental compliance report based on checklist will be submitted.	Contractor
4.	**Provision of first aid in case of any emergency**	• First Aid will be provided immediately to save the life of affected people. • Ambulance will be called up to shift the affected persons to the nearest medical facility.		Immediate as per need	First Aid Box will be provided on site.	Contractor
5.	**Health, Safety and Environmental needs**	• Contractor will prepare project specific Health & Safety Plan and get its approval from the supervision consultant. The contractor will ensure the health		Conduct site inspection on monthly basis to assess the enforcement of safeguard plans and if require make necessary	During construction of sub-project, Health Safety attributes will be provided and environmental compliance report based on	Contractor

[12] Pre-construction analysis is already incorporated in report.

Sr. #	Identified environmental and social issues	Monitoring Parameters	Monitoring Site	Monitoring Frequency	Reporting frequency	Responsibility
		and safety issues are managed efficiently through implementation of approved H&S and other safeguard plans (traffic management plan, waste management plan etc.) • Adequate safety precautions such as helmets, safety shoes, gloves, etc. should be provided to the labour.		amendments. s	checklist should be submitted.	
6.	**Public Consultation**	• Local residents in the sub-project area will be informed about the sub-project details, sub-project schedule and GRM.		Quarterly basis during construction phase and during first two years of operational phase of the project to assess community response on the project's benefits or drawbacks. In case of any complaint, emergency visit will be organized by PTEGP's E&S team.	During and after completion of sub-project; social compliance section of quarterly progress report for the project.	Contractor Supervision Consultant and PTEGP
7.	**Economic Losses**	• loss of land, • damage to structures, • damage to trees/plants,		Quarterly basis during Construction Phase In case of any complaint, emergency visit will be organized.	ARAP implement before commence construction. Quarterly progress report	PTEGP Contractor Supervision Consultant
8.	**Privacy Issues**	• Contractors would be trained to address privacy	Sub-project Site	As per requirement of Training Plan	Before and During construction phase of sub-	Contractor

Sr. #	Identified environmental and social issues	Monitoring Parameters	Monitoring Site	Monitoring Frequency	Reporting frequency	Responsibility
		issues and behave ethically. • Labours would be strictly asked to cater the privacy issues. All site workers should sign the Code of Conduct and follow during working on site. • Training should be delivered by the concern person from supervision consultant to site workers on environment and social aspects for their capacity-building			project; environmental and social monitoring report will be submitted.	

CHAPTER - 6: COMMUNITY AND STAKEHOLDERS' CONSULTATION

The objective of public consultation is to ensure that the sub-project proponent should share relevant information about the sub-project interventions and their potential environmental and social impacts with all stakeholders. Consultation is a two-way process by which the knowledge and views of affected persons, and other interested parties are considered for purposes of decision making. Information dissemination during public consultation by the sub-project proponent or representative is fundamental to meaningful consultation.

Consultation sessions were held with different stakeholder groups who may be affected positively or negatively by the proposed sub-project. The consultation process was carried out in accordance with the World Bank's policy and guidelines.

Consultations were conducted to:

- Obtain feedback from primary stakeholders and community members (including women).
- Obtain feedback from secondary stakeholders.

The purpose of the meetings with stakeholders was:

- To inform the communities about the overall objectives of the sub-project and the scope of work involved in the execution of the sub-project.
- To receive and document feedback and views of the stakeholders.
- To determine the needs of community members.
- To consult community member about the construction of contractor camp and other associated activities (influx of labour, construction activities, waste disposal sites).
- Develop a schedule for future consultations.

Consultation sessions were carried out with concerned stakeholders including local community, visitors and administrations to brief them about sub-project activities and future benefits resulting from rehabilitation. During the consultation's meetings, stakeholders showed keen interest in execution of proposed sub-project activities.

Staff from the Project Management Unit and C and W also participated in the stakeholder consultations. The list of attendees of each meeting is provided in Annexure C.

A summary of the main comments and views expressed by stakeholders and the measures taken to satisfy them during the consultation are included in the following table:

Table 6-1: Summary of Key Discussions

No.	Agenda of items	Date	Place of Meeting	Discussion Points
1.	Horticulture issues and management			As per discussion with DFO, Jhelum, cutting of 1,256 trees is involved in which Keekar

No.	Agenda of items	Date	Place of Meeting	Discussion Points
		18-09-2020	Forest Department, Jhelum (Executive Engineer Forest Jhelum)	and Phulai trees are most common. Total cost which was demanded from Highway Division by Forest Department is comprised of three following factors: Replenishment cost: 14.044million Timber Extraction cost: 1.06 M Reference letter is attached as *Annex B*.
2.	Biodiversity conservation	18-09-2020 and 12.10.2020	Forest Department, Jhelum (Executive Engineer Jhelum)	• Local flora is important to provide shelters for the fauna, offer fruits/or timber/firewood and protect soil erosion. The loss of biodiversity could have large scale adverse impacts on the ecosystem services. • DFO added that tree plantation on other side of proposed sub-project (Option-II) starting from Sohail Gate with total area of 800sq.ft is not possible due to hard strata of soil. Tree plantation plan will be implemented at alternate place with due consultation of concerned department. The new plantation site will be finalized with Punjab Forest Department, according to the department's annual plantation plan. One possible site for new plantation is Dara Pur Forest Reserve area, about 30km from the site.

No.	Agenda of items	Date	Place of Meeting	Discussion Points
3.	Creation of Job opportunities	12-10-2020	Archaeological Department (Director Archeology)	There is concern from community regarding job opportunities. Priority will be given to local area inhabitants for skilled and unskilled construction labour jobs. Majority of labour need will be met from the sub-project areas. The sub-project will also require skilled workers, and these may be available from the community. It is anticipated that approximately 75% of the workforce will be from the sub-project area while some 25% of labour (skilled) would be hired from outside the sub-project area.
4.	Traffic accidents prevention	12-10-2020		Road accidents will be reduced by construction of this road.
5.	Land Acquisition and Resettlement Action Plan (LARAP)	18-09-2020	C and W Department, Jhelum (Executive Engineer Highway Department)	1500ft square of land will be acquired. There are no households residing in this 1500ft square area, therefore there will be no physical displacement of households. Since, the no. of owners of the said land as per Land Record are less than 200, therefore Abbreviated RAP (ARAP) will be needed for mitigation and compensation. ARAP will be finalized and compensation will be paid to the project affected persons before commence civil work on site.
6.	Is there a Grievance Redress Mechanism		Deputy Director Development	A sub-project GRM will be set up prior to start of civil works in accordance with Project ESMF. For effectiveness and operationalization of GRM, a

No.	Agenda of items	Date	Place of Meeting	Discussion Points
	(GRM) in the sub-Project?	18-09-2020	(DDD) Office, Jhelum	meeting with DDD, Jhelum was arranged. He is requested to address the grievances if arise during execution of the sub-project. He is also informed about sub-project GRM web link and its description.
7.	Establishment of Wildlife Corridor	19-09-2020	Wildlife Department, Jhelum (Assistant Director Wildlife Jhelum)	Road construction has direct and indirect effects on the ecosystem, resulting in the deterioration of natural landscapes and is expected to result in habitat fragmentation. Construction of road may serve as a barrier for wildlife movements. In the process of protecting the wildlife, it is important to develop ecological corridors[13] to reduce the disturbance for species movement. District Officer-Wildlife proposed to develop corridor for fauna along sub-project.
8.	Flora of the area and possible sites for new plantation as a part of replenishment of uprooting of trees require for execution of the project.	01-02-2023	Forest Office, District Jhelum (Executive Engineer Forest Department, District Jhelum)	• No sensitive or protected species of flora recorded in the project area. Main type of flora is Phulai and Muskat. Shesham trees finds randomly in the area. • There are number of forest reserve areas in District Jhelum where new plantation can be carried out as a replenishment plantation. • Forest Department surveyed the alignment of proposed by pass road and revised details of affected trees.

[13] DFO proposed to construct corridor for routine wildlife movement.

No.	Agenda of items	Date	Place of Meeting	Discussion Points
				• Revised cost of replenishment and compensation of uprooting of trees were issued by Forest Department during December 2022.
9.	Local community comments on proposed work scheme	31-01-2023	Rohtas Fort (M Afzal- retired Pakistan Army employee, currently running a taxi Rikshaw between GT Road and Rohtas Fort)	• Tourist from all over the country and occasionally foreigner tourist visit the fort over the whole year. Winter season is comparatively busier than summer. • There are few quarries and coal mines in the area and therefore heavy traffic often observe on the road leading to the fort. Proposed By-pass road will improve road safety and reduce traffic congestion. • Local community should preferred for job opportunities. • PMU responded that the contractor will be bound to give preference to the local human resources through implementation of ESMP.
10	Consultation with Women of the area	19-8-22	Rohtas Fort Village	• Woman raised concern of migrated labour in the area. PTEGP informed that maximum local labour will be hired for the project. In addition, it will be ensured that migrated labour respect privacy and cultural values of local community. • The proposed project was appreciated by the women. It was raised that the provision of bypass will improve the road safety

No.	Agenda of items	Date	Place of Meeting	Discussion Points
				and kids movement along the road particularly during schooling time.

The list of women participants is provided in Annexure C. District Administration, was also consulted and informed about the PTEGP project.

The list of attendees is provided in the Annexure C.

Meeting with XEN Highway Division Jhelum

Meeting held with XEN Highway division Jhelum for the agenda of construction of new road. The important topics to be discussed were planning and concern regarding traffic.

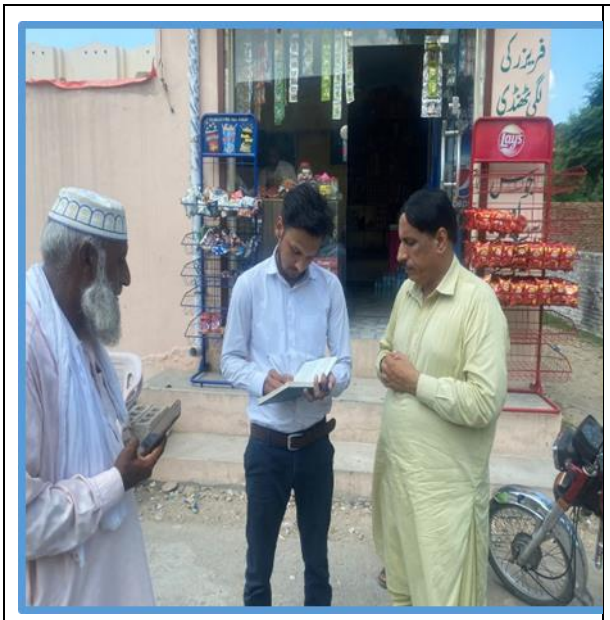
Consultation with Executive Engineer Jhelum Highway Department

Consultation with Forest Department Office in Jhelum

Local flora is important to provide shelters for the fauna, offer fruits/or timber/firewood and protect soil erosion. The loss of biodiversity could have large scale adverse impact on the ecosystem services. DFO added that tree plantation on other side of proposed sub-project (Option-II) starting from Sohail Gate with total area of 800sq.ft is not possible due to hard strata of soil. Tree plantation plan will be implemented at alternate place with due consultation of concerned department.


Consultation with DFO Jhelum and his concern staff from Punjab Forest Department

Consultation sessions were also held with different stakeholder groups who may be affected positively or negatively by the proposed sub-project. To inform the communities about the overall objectives of the sub-project and the scope of work involved in the execution of the sub-project. Public and stakeholder views were considered in deriving the mitigation measures and planning the work activities. Consultations pictorial views are provided below:

	
Consultation with local shop owner	Consultation with visitors

	
Consultation with Local Residents	Consultation with Local Residents
	
Consultation with Local Community Member	Consultation with Woman of the Area
	
Water Sampling from Existing Groundwater Source	Consultation with Women of the Area

	
Consultation with Woman of the Area	Consultation with Woman of the Area
	
Consultation with Local Taxi (Rikshaw) Driver	Second Consultation with Executive Engineer Highway Department

CHAPTER - 7: CAPACITY BUILDING

Capacity building is an evidence-driven process of strengthening the abilities of individuals, organizations, and systems to perform core functions sustainably, and to continue to improve and develop over time. Individual/workforce level capacity building activities improve the performance of staff according to ESMPs depending on specified activities and executing body.

Therefore, a comprehensive training program will be followed, to strengthen the technical and institutional capacities of the executing agency, contractors and labourers. Training program will be finalised by the supervision consultant. The plan will be implemented by the contractor.

Trainings for contractors will be organized when the bidding process will be completed. It will be suggested to develop inventory at sub-project site to address potential impact during construction. Contractors shall be bound for environmental and social compliance otherwise cost will be deducted as per break-down of environmental mitigation cost (item wise) in ESMPs. Training program will be planned as per requirement.

Following tentative training programs will be executed for the overall effective implementation of the ESMP and Health & Safety Plan. Supervision Consultant will finalize the programme with the collaboration of the contractor.

A tentative training Framework is given below:

Table 7.1: Tentative Training Detail

Description of Training	Training Module	Location and Trainer	Participants
One day training on Environmental and Social Management Plans (ESMP)	• Introduction to ESMF and ESMP • WB Safeguard policies • Local Laws on Environment • Key environmental and social issues associated with the sub-projects • Audio-video display regarding HSE	PMU Office PTEGP's Env. Specialist	Supervision Consultant and Contractor's Site Managers, Env. And social Specialist/Expert and Supervisors
One day Training on Appropriate personal protective equipment (PPE) and First Aid	• What is the purpose of PPE? • How important to use PPE? • How to use PPE? • First Aid • Health Safety aspects	Site Office Contractor's Health & Safety In-charge	All Site Workers s
Gender-based violence, including sexual harassment, child abuse and exploitation. All site workers should sign and follow the Code of Conduct. A copy of	• Mandatory and regular training for workers on required lawful conduct in host community and legal consequences for failure to comply with laws; • workers' misconduct and complaints/reports on gender-based violence or harassment through the GRM	Site Office	Contractor's site supervisors and Labours

Code of Conduct and a brief explanation will be delivered in this training session.	• Provision of opportunities for workers to regularly return to their families	Contractor's Env. And Social Expert	
Half day training on Experience sharing and lesson learnt	• Lesson learnt due to implementation of ESMPs • Lesson learnt during social mobilization	PMU Office Env. And Social Specialist from Supervision Consultant and PTEGP's Env. Specialist	Contractor's Site Managers and C&W Concern person(s)

Following table is giving an overview regarding awareness sessions to be held at sub-project site by the contractor's environmental and social Expert on regular basis.

Table 7.2: Summary of Awareness Sessions for Contractors/Labour force

Potential Impact	Proposed Measures Avoidance and Mitigation
Environmental Aspects	
• **Temporary habitat loss or disturbance** • **Temporary visual intrusion** • **Noise level increase at a single location** • **Waste generation** • **Discharge of sanitary effluent**	• Site-specific landscape restoration measures. • Limit the working hours of noisy activities when near identified sensitive receptors to normal daytime working hours. • Operate equipment in a manner sympathetic to the ambient noise environment. • Do not leave equipment idling unnecessary. • Eliminate tonal, impulsive or low frequency noise through noise control engineering techniques where practicable (fitting of mufflers, damping, etc.), and substitute for a different method if necessary (e.g., instead of hammering actions, use hydraulics). • Provide adequate warnings of impeding works to all potential receptors • Implement Waste Management Plan to include procedures for proper disposal of solid waste • Ensure that discharge of sewage from temporary construction facilities to surface courses does not impact surface water

Site Staff: Relevant personnel at site must be trained for the following:

- Techniques for waste minimization and water conservation

- Applicable environmental, health and safety compliance
- Water sprinkling at connective intervals
- Catering of Privacy issues

Contractors shall also provide safety equipment i.e., PPEs, safe drinking water, first aid boxes, site specific GRM is in place etc. to the workforce as per the nature of their jobs.

Contractors have to comply with the following responsibilities:

- Observation of timings and make a schedule that the surrounding community should not be affected by noise pollution, air emissions and disturbances in their routine work and avoid use of heavy machinery while working close to the built up area.
- Ensure usage of machinery/ equipment producing negligible/low noise.
- Ensure health, safety and protective measures including safety equipment, safe drinking water, first aid boxes etc. are in place for the workforce as per nature of their jobs.
- Water sprinkling to avoid air/dust pollution.
- Indicate alternate travel routes and provide indicators at suitable places during work timings.
- Local labor will be preferred to work on site.
- Child labour is strictly prohibited as per labour law. All labour should be aged above 14 year.
- Information should be provided to the surrounding populations before pre-construction and privacy of women should not be disturbed.
- Safety and security of school children sub-project route during construction period will be ensured.
- Proper disposal of wastes and garbage.
- Health, safety and protective measures for the labour are in place.
- Notice board of emergency numbers and GRC should be placed at proper place on site.

Ensuring implementation of all these mitigation measures; will not only help their company profile boost up, but it will also enable them to qualify and win future sub-projects. It will also be briefed, that the contractors having environmental and social safeguards experience in their company will be preferred during evaluation.

CHAPTER - 8: INSTITUTIONAL ARRANGEMENTS AND IMPLEMENTATION MECHANISM

Institutional arrangements for project oversight, management coordination and implementation would be guided by a systematic process of assessments. This will help to define an optimal institutional mix that will guarantee efficiency and effectiveness in delivering project outcomes to project beneficiaries, ensure achievement of the intended results, and permit evaluation of impacts and documentation of the lessons learned.

Planning and Development Board, GoPb is the Implementing Agency for Punjab Tourism for Economic Growth Project. PMU is led by a Project Director. PMU includes a Financial Management Specialist, Admin and Accounts officer, a Procurement Specialist, Environmental Specialist, A Social Safeguard and Gender Specialist, and a Monitoring and Evaluation Specialist. In addition to PMU staff, Deputy Director Development (s) of concerned Districts under PTEGP will provide implementation support on all aspects to the project and serve as District Coordinating Officer.

PMU will have the responsibility for project implementations including, but not limited to reporting, monitoring, and evaluation, social and environmental management, procurement, financial management, audit, and disbursements, as well as coordination with the line departments and the World Bank. C and W Department is coordinating in parallel with PMU for the hiring of Construction Contractor and the supervision is performed by PISC Firm.

The Contractor will prepare a Contractor ESMP (CESMP) in lines of this document before commence work on site and get its approval from the supervision consultant. Environment Specialist and Social Safeguard and Gender Specialist will ensure the implementation of CESMP through the contractor and will submit the CESMP implementation progress report. Both will be directly responsible for the internal monitoring and progress reporting by doing site visits regarding the compliance of ESMP.

8.1 Monitoring Mechanism Under ESMP

ESMP monitoring will be carried out to ensure that the mitigation plans are regularly and effectively implemented. It will be carried out at four levels. Safeguard Team of PMU will carry out ESMP monitoring to ensure that the mitigation plans are being effectively implemented and will conduct field visits on regular basis. District Coordinator and PISC firm will also be responsible for the effective implementation and monitoring of CESMP.

8.2 Documentation and Reporting

The Environment Specialist and Social Safeguard and Gender Specialist will produce quarterly progress reports based on the information collected. These reports will include all aspects of the ESMP, including:

- Minutes of Meetings with contractors
- Laboratory analysis during construction phase
- Safety attributes compliance
- Implementation of mitigation measures
- Capacity building sessions
- GRM implementation
- Any other ESMP implementation activity carried out during the reporting period

8.3 Information Disclosure

The ESMP report will be uploaded on the websites of PMU-PTEGP and it will be made available in the local offices of C and W and the District Administration, and at a central point/place at the sub-project. ESMP will also be the part of contract agreement with the contractors. Briefing session with contractors regarding effective implementation of ESMP would be arranged. Safeguard Team will keep the stakeholders informed about the environmental and social impacts throughout the sub-project construction phase and facilitate in addressing grievance (s).

CHAPTER - 9: ESMP BUDGET

Most of the environmental and social management activities will be undertaken by the Contractor. Therefore, the cost of ESMP activities will be included in the Contractor Budget and Bill of Quantities (BoQs) under a separate cost head in accordance to the procurement procedures. The ESMP implementation budget will be applicable for this sub-project. The cost details for the implementation of ESMP details are provided in the table below.

Table 9-1: ESMP Implementation Cost[14]

Name of item	Quantity	Unit	Unit Rate	Total Amount
Dust / Surgical masks	35000	Each	20.00	700,000
Safety Shoes	160	Each	2500	400,000
Gloves	500	Each	500	250,000
First Aid Box	10	Each	5000	50,000
Ear Plugs	500	Each	100	50,000
Safety Helmets	160	Each	500	80,000
Safety Jackets/Hi-Viz	320	Each	900	288,000
Sanitizer	320	L/S	200	64,000
Thermogun	10	Each	3399	33,990
SUB TOTAL (1)				**1,915,990**
Environmental Monitoring During Construction Phase				
Ambient Air Quality Analysis (SOx, NOX, CO, PM2.5, O3,)	6	Each	60,000	360,000
Noise Level Monitoring	02 (Noise meters)	Each	100,000	200,000
Water Analysis	12	Each	30,000	360,000
SUB TOTAL (2)				**920,000**
Others				
Provision of Rubbish Bins + bags supply	100	Each	2000	200,000
Reflective Tape	500	Each	360	182,000
Safety cones	100	Each	1780	178,000
Safety boards	50	Each	3000	150,000
Temporary traffic signal or speed breakers for managing traffic	L/S	L/S	L/S	500,000
Implementation of Training Plan	4 sessions	Each	50,000 per session	200,000
Water Sprinkling	L/S	L/S	L/S	500,000
Vegetation Replenishment Cost	1% of the project cost	1	19,165,390	19,165,390
SUB TOTAL (3)				**21,075,390**
GRAND TOTAL (1+2+3)				**23,911,380**

[14] This is estimated cost which may vary as per market rate.

CHAPTER - 10: GRIEVANCE REDRESS MECHANISM (GRM)

The Project's Citizen Engagement (CE) strategy includes establishing a Grievance Redress Mechanism (GRM) in the PMU (PTEGP) and in all the nominated project districts. The Grievance Redress Mechanism (GRM) is directly linked to the transparent implementation of ESMF and RPF. A key objective of the GRM is to establish procedures for filing any grievances and disputes on social and environment issues and other entitlement issues arising out of the implementation of ESMP and ARAP. A multi-tier GRM has been proposed in the PTEG.

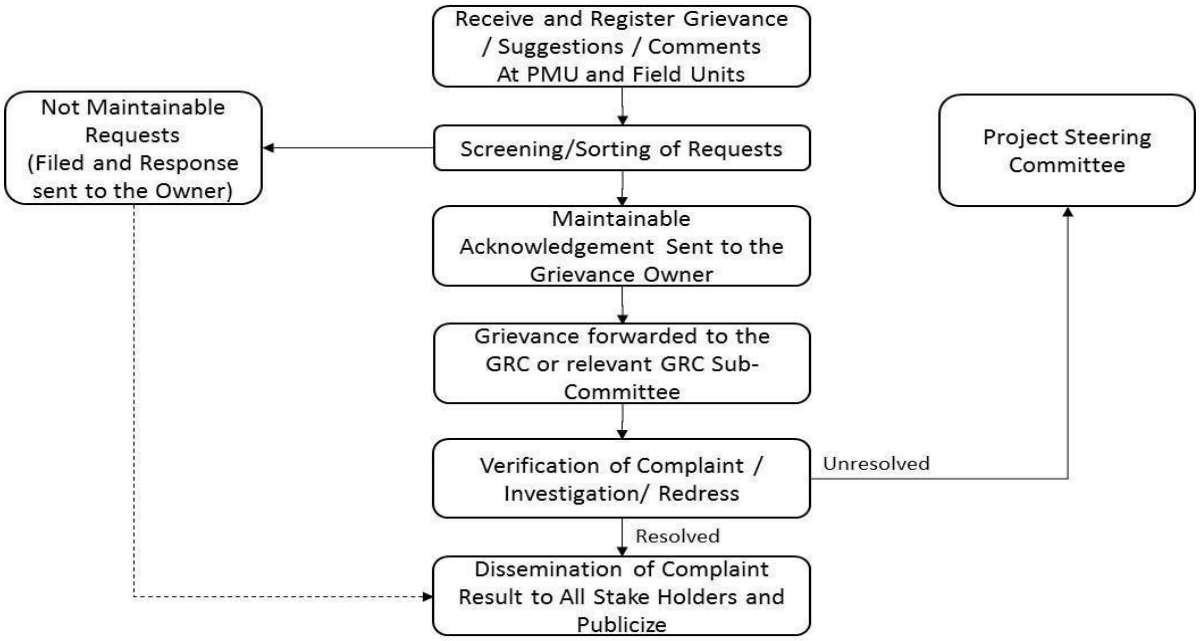


Figure 10-1: Key Steps in Grievance Redress Mechanism

Environment and Social Management Framework (ESMF) and the same will be followed in this ESMP. The lowest tier of GRM will be at sub-project level and the Project Steering Committee (PSC) will serve as an appeals mechanism and be the highest forum for resolution of any complaint. A matter reported to this forum will be decided in not more than one month.

10.1 Legal And Policy Reforms

Grievance Redress will be convened as per the World Bank OP 4.12 which requires an appropriate and accessible grievance redress mechanism for affected persons, including displaced persons and host communities.

Table 10-1: Types of Grievances

• Loss of livelihood • Compensation issues • Local Culture and norms • Dust, noise and air pollution from construction activities • Intensive schedule of construction activities	• Water Pollution • Waste disposal • Health and safety • Criminal activities • Loss of business/income • Traffic Movement	• Damage to structure/properties • Impacts on livelihood • Obstruction in access etc. • Resettlement issues and land acquisition • Privacy issues

• flow • Access to natural resources	• Inappropriate timing of construction vehicle • Nuisance	• Any other related with Environment and Social Safeguards.

10.2 Sub-Project Site Specific Grc:

GRM will be ensured to be effective at site especially during and post construction. Different types of grievances will be generated as described in types of grievances. However, following will be composition for Grievance Redress Committee at sub-project will be notified after awarding of contract:

Composition of Grievance Redress Committee (GRC)

1. Deputy Commissioner/Representative (Chair)
2. Social Safeguard and Gender Specialist. (Secretary)
3. Sub-Engineer (C and W Department) (Member)
4. District Coordinator Officer (Coordinator)
5. Local Representative (Member)
6. Contractor (Member/Representative)
7. Special Invitee (as needed)

Composition of PMU-based Grievance Redress Committee (GRC)

A Grievance Redress Committee has been notified with composition of following members:

1. Project Director, PTEGP. (Chair)
2. Social Safeguard and Gender Specialist. (Secretary)
3. Deputy Commissioner/Representative (Member)
4. District Coordinator Officer (Coordinator) (Coordinator)
5. Deputy Secretary-PC[15] (C and W Department) Member
6. Special Invitee (as needed)

10.3 Procedure:

A. **Inception**

- Receipt of Complaint: The complaints will be recorded on an online Grievance Redress System. Complaints can also be received in person or through complaints box available at site, complaints register available at site and PMU office, telephone, web link or mail[16].

[15] Project Coordinator
[16] Complaint register/box will be installed at sub-project site.

- Registry of Complaint: The Grievance Redress Officer (GRO[17]) will enter the details of complaint, including the subject, date of receipt, CNIC of the complainant, into a computerized grievance record system (GRS).
- Acknowledgement: GRO will also send an acknowledgement to the complainant within 3 days.
- Forwarding to the Appropriate Forum: In case of complaints related to the Project sites at district level, GRO will be Deputy Coordinator and if it is related to Project Management Unit (PMU) or stakeholder departments, the SS and GS will look up the matter.

Table 10-2: Time Frame

Sr.#	Subject	Time	Activity
For Local complaint @ Site			
1.	Receipt and acknowledgment of Complaint	Within 3 Days	Registration, forwarding and Acknowledgment
2.	Forwarding of complaint to DCO (PTEG)	7 Days	Dispatch of complaint to concerned department and immediate action
	At PMU level		
3.	Final disposal of complaint to Secretary	15 days	Proposing action or sending to concerned department accordingly
4.	If could not resolve, forward to Chairman of Project Steering Committee	30 days	Final decision on grievance and its solution

B. Review and Decision

- At District Level: The GRO will resolve the complaint within 7 days and inform the complainant. In case the complainant is not satisfied with the redress of his/her grievance, the complaint will be referred to the PMU.
- At PMU Level: Secretary will resolve the complaint within 15 days and inform the complainant.[18] In case the complainant is not satisfied with the redress of his/her grievance, the complain is refer to the apex body of GRC.

C. Closure of Grievance

The complaint shall be considered as disposed and closed when:

- The designated GRO/authority has acceded to the request of the complainant fully;
- Where the complainant has indicated acceptance of the response in writing;
- Where the complainant has not responded to the Grievance Redress Officer within one month of being intimated about the final decision of the grievance officer on his
- Grievance/complaint;

[17] DCO would be GRO "Grievance Redress Officer"
[18] 3 days (minimum time)

- Where the complainant is informed in advance, but fails to attend the proceedings of the Grievance Redress Officer within the stipulated period of the disposal of the complaint;
- Where the complainant withdraws his/her complaint.

D. Conveying the Decision:

The GRO will convey the redress decision, at all levels, to the complainant, within 5 days of decision.

E. Feedback:

The GRO will solicit the satisfaction of the complainant regarding the redress decision and will enter it into the GRS. Satisfaction of the complainants may also be validated through a third party.

The Grievance Redress Mechanism has been made functional at PMU level. A complaints link has been created at PTEGP website (https://ptegp.punjab.gov.pk/grm), where people can register their complaints. Furthermore, a complaint register will be placed in the site villages before the starting of construction work.

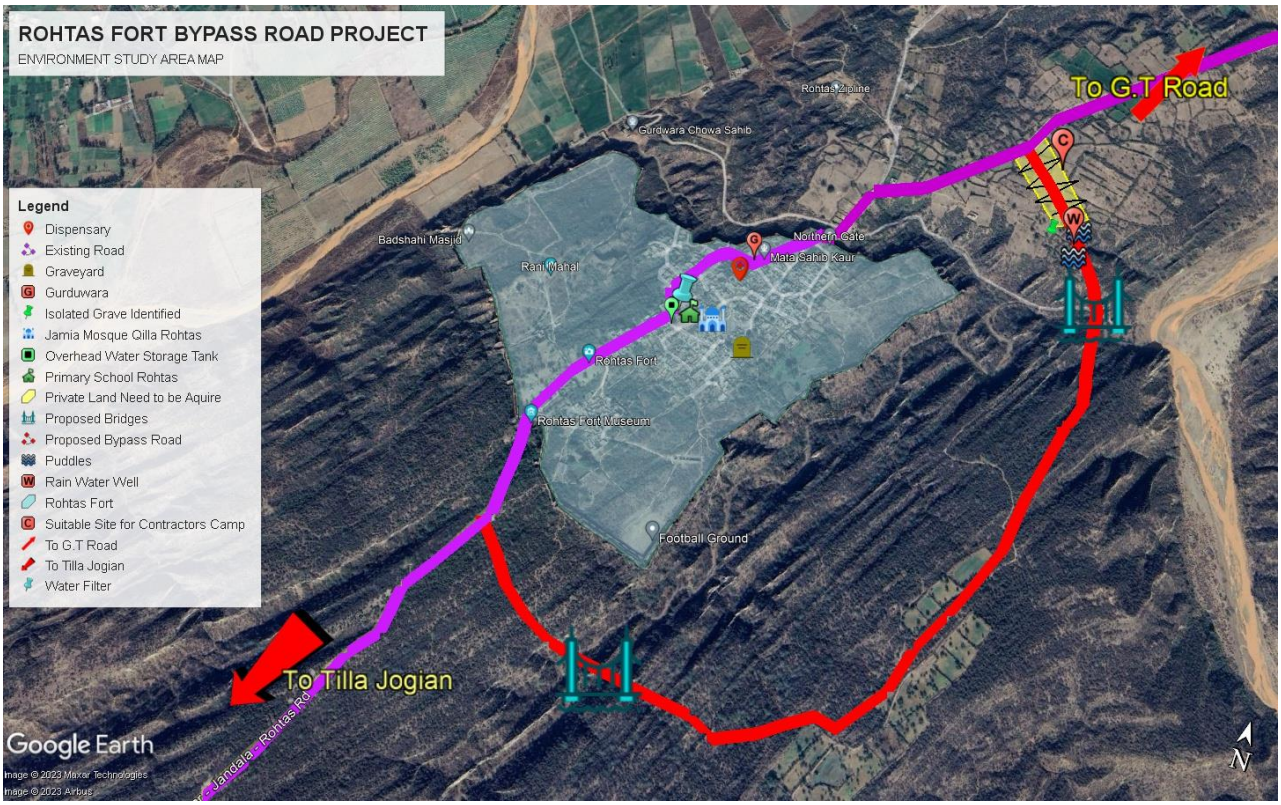
F. Exclusions:

The following allegations/complaints shall not be construed or taken up for consideration and disposal as 'Grievances':

- Anonymous complaints or Frivolous cases in respect of which inadequate supporting details are provided;
- Cases involving decisions/policy matters in which the complainant has not been affected
- directly/indirectly;
- Cases where quasi-judicial procedures are prescribed for deciding matters or cases that are sub-judices;
- A Grievance which has already been disposed by the higher-level Grievance Cell; and
- Complaints of corruption which should be lodged and dealt with separately from this system.

ANNEXURES

ANNEXURE A: ENVIRONMENTAL STUDY AREA MAP



ANNEXURE B: DETAILS OF VEGETATION REPLENISHMENT COST AND ILLUSTRATED TREE PLANTATION PLAN

NO. DFO.JLM/LC -G-784
DIVISIONAL FOREST OFFICER
JHELUM
PHONE # 0544920032
Email dfojhelum@hotmail.com
Dated Jhelum 30-12-2022

To,

The Executive Engineer,
Highway Division Jhelum

Subject: - **NO OBJECTION CERTIFICATE – CONSTRUCTION OF ROHTAS FORT BYPASS ROAD LENGTH= 3.60 KM DISTRICT JHELUM.**

Reference:- Your office letter No.856/C dated 16.06. 2020.

As per Government of Punjab Forestry Wildlife and Fisheries Department order No. SOFT (EXT) VIII-40/2009 dated 11.10.2019 & No. SOFT (EXT)VIII-9/80 dated 31.05.2018 and Chief Conservator of Forest Northern Zone Rawalpindi No.197-98/AL dated 03.11.2022, the tree removal case creating hindrance in the Construction of Rohtas Fort Bypass Road length = 3.60 km dues on account of compensation value & Replenishment cost is calculated , detail is as:-

A. Detail of trees effective/removed

S#	No. of trees effected	Timber	Firewood	Total	Shisham Unit	Remarks
1	149	11.40	48.328	59.728	29.017	Will be removed after approval of authority through open auction.
2	1107	0	0	0	0	
Total	**1256**	**11.4**	**48.328**	**59.728**	**29.017**	

B. Compensation

1. 149 No. trees = 284000/-
2. 1107 Pole Crop @ 700/= 774900/-

Total 1058900/-

C. Replenishment Cost

3.60 x 5 Rows= 18 AV.KM =
18*780218= **14043924/-**

You are therefore requested to kindly provide the Cheque of Rs.15102824/- on account of compensation Rs.1058900/- on account of Replenishment Cost Rs.14043924/- in favor of DFO Jhelum at earliest, so that the complete case may be formulated and submitted to competent authorities for final approval please.

An early action in this regard is highly appreciated.

Divisional Forest Officer,
Jhelum Forest Division.

No. Dated Jhelum the 2022.

Copy is submitted to:-

1. The Conservator of Forest Potohar Forest Circle Rawalpindi for favor of information.
2. The XEN highway Department Jhelum for information.
3. Sub Divisional Forest Officer Jhelum for information with reference to his letter No. memo/SDFO/JLM dated 28.12.2022.

Divisional Forest Officer,
Jhelum Forest Division.

ANNEXURE C: LIST OF CONSULTATIONS WITH DISTRICT ADMINISTRATION AND COMMUNITY MEMBERS

SR.#	NAME	DATE	DESIGNATION	DEPARMENT
1.	Qamar Ali Saqib	18.09.2020 and 19.09.2020	Executive Engineer	Punjab Highway Department
2.	Izhar-ul-Haq		Deputy Director	Environment Protection Department
3.	Iftikhar Sb.		SDO	Highway Sub-division Jhelum
4.	Sudheer Ahmed Mughal		DFO Jhelum	Forest Department
5.	Asim Bilal		Assistant Director Jhelum	Wildlife Department

SR.#	DATE	PLACE OF MEETING	NAME
1.	19.08.2022	Office of Archaeology, Rohtas Fort, Jhelum	Raja Imran Siddique
2.			Syed Ghayour Hussain
3.			Arshad Hunain Mughal
4.			Umer Farooq
5.			Sajid Mahmood
6.			Iftikhar Ali
7.			Muhammad Ayub
8.			Muhammad Khizar
9.			Khalid Sarwar
List of Women consulted			
1.	19-08-2022	Rohtas Fort, Jhelum	Afshan Zaheer
2.			Mishbah Imran
3.			Humaira Ali
4.			Shagufta Mumtaz
5.			Huma Khalid
Stakeholder and Public Consultation completed in 2023			
6.	01-02-2023	Forest Office, District Jhelum	DFO Jhelum, Forest Department Sudheer Ahmad Mughal
7.	31-01-2023	Rohtas Fort, Near Project Site	Muhammad Afzal Local Taxi (Rikshaw) Driver

Annexure D:

ANNEXURE D: ENVIRONMENTAL & SOCIAL SCREENING FORM AND CHECKLIST

PUNJAB TOURSIM FOR ECONOMIC GROWTH PROJECT			
Sub-project Title: Construction of Rohtas Fort Bypass Road Length = 3.2160Km District Jhelum			
Sub-project location (area/district/site): District Jhelum			
Sub-project scope of work: construction of new road			
Implementing Agency: C&W Department			
Date of screening: 18.09.2020			
Responsible Agency: PTEG			
S/N.	**Screening Criteria**	**Yes/No**	**Explanation**
ENVIRONMENT			
1.	• Is the subproject in an eco-sensitive area or adjoining an eco-sensitive area or monument? (Yes/No) • If yes, which is the area? Elaborate impact accordingly.	Yes	Rohtas Fort. Impact is positive with reduction in air pollution and vibration generated due to extensive vehicle movement along Rohtas Fort road. Some Rohtas Fort gates are narrow and passage of heavy vehicles (buses/trucks/tractors) risk damaging them.
2.	Will the subproject create significant/limited/no environmental impacts during the construction stage?	Yes	Brings change in land scape and cutting of 6089 trees is involved.
3.	Clearance of vegetation/tree-cover/other	Yes	Cutting of about 6089 trees is involved.
4.	Direct discharge of construction run-off, improper storage, and disposal of excavation spoils wastes and other construction materials adversely affecting water quality and flow regimes.	Yes	Mitigation measures to control run-off, and other waste material affecting water quality will be followed by the contractor.
5.	Flooding of adjacent areas.	No	

6.	Improper storage and handling of substances leading to contamination of soil and water.		• Cost for timely shifting of material is included in sub-project estimates. Avoid pilling up material at site. • Control at source to stop on-going contaminant releases. • Assessment and delineation of the contaminated area may be necessary to control further contamination. • For placement of construction material, impermeable base would be provided to control contamination of soil & water. Display of MSDS[19] at site will be ensured.
7.	Elevated noise and dust emission.	Yes	To control noise, earplugs would be provided to workforce. For dust, water sprinkling will be done at regular intervals.
8.	Disruption to traffic and visitor's movements.	No	No disruption to traffic as this route is not in use.
9.	Damage to existing infrastructure, public utilities, and amenities.	No	Public utilities and infrastructure were not observed along ROW.
10.	Failure to restore temporary construction sites.	No	Contractors would be strictly adhered to restore the temporary construction site and ensure regular monitoring.
11.	Possible conflicts with and/or disruption to local community and/or visitors.	Yes	Not a single household is found at sub-project area. However, 1500ft land is acquired which may result in conflict arising. Compensation will be paid.
12.	Health risks due to unhygienic conditions at workers 'camps.	Yes	Contractors' training would be conducted to avoid health risks. Site monitoring will be ensured for effective implementation of health safety plan.
13.	Will the subproject create significant/limited/no environmental impacts during the operational stage? (Significant / limited / no impacts) • Flooding of adjacent areas		Traffic load will be increased due to construction of the road which may result in pollution. During

[19] Material Safety Data Sheet

	• Impacts to water quality due to effluent discharge • Gas emissions • Safety hazards Other, specify.	Yes	preparation of Environment Impact Assessment, mitigation measures will be proposed according to scope of work.
14.	Does the subproject involve any prior clearance from the State Forest Department for either the conversion of forest land or for tree-cutting? (Yes/No). If yes, which?	Yes	Tree cutting of about 6089 trees.
CULTURAL HERITAGE			
1.	Will the subproject create significant/limited/no cultural properties impacts?	Yes	It creates positive impact on cultural point by reducing traffic load.
2.	Involve significant excavations, demolition, and movement of earth, flooding, or other major environmental damages.	Yes	Rock cutting is major component to connect both sides from Dina to Rohtas Road.
3.	Is located within or in the vicinity of a recognized cultural property conservation area or heritage site	Yes	Rohtas Fort, however the heritage site is more than 200 feet away from the proposed new road and therefore no adverse impact is anticipated from the construction activities on the heritage site.
4.	Is designed to support the management or conservation of a cultural property.	Yes	Purpose of constructing by pass road is reducing the traffic load on the road passing through the cultural property. This will also minimize the air pollution impact on the historical building. By controlling aging factor, it will be helpful to preserve the structure.
5.	Other, specify.	No	
6.	Does the subproject involve any prior clearance from the Archeology Department for either the conservation or management of heritage sites or vicinities? (Yes/ No). If yes, which?	No	

SOCIAL			
1.	Will the subproject create significant/limited/no social impacts?	Yes	There will be limited adverse social impact. Impact will largely be positive as bypass road will contribute towards protection/conservation efforts aimed at the Fort, and enable area residents to continue to use road transport between their villages and main G.T. Road.
2.	Land acquisition resulting in loss of income from agricultural land, plantation, or other existing land.	No	No loss of income and agricultural land. It involves acquiring of 1500ft square private land which is barren land. Proposed ARAP will confirm this.
3.	Impact on livelihood and economic activity.	No	Job creation will create positive impact.
4.	Land acquisition resulting in relocation of households.	Yes	1500ft square of land will be acquired. There are no households residing in this 1500ft square area therefore there will be no physical displacement of households. Since, the no. of owners of the said land as per Land Record are less than 200, therefore Abbreviated RAP (ARAP) will be needed for mitigation and compensation. As per the record the valuation of land per Marla is Rs. 22,750/-
5.	Any reduction of access to traditional dependent communities (to areas where they earn for their primary or substantial livelihood).	No	There will not be restriction on access or adverse impact on livelihood of any person.
6.	Any displacement or adverse impact on tribal settlement(s).	No	No existence of tribal settlements along sub-project.
7.	Adverse impacts to women, including economic and safety concerns.	No	The proposed bypass road area is uninhabited and has no dwellings. Nearby dwellings do not use this area for any purpose, but this will be confirmed during preparation of ARAP.
8.	Impact on infrastructure (roads, water supply,	No	Infrastructure does not exist along

	any other type of infrastructure) • Other, specify.		sub-project
OVERALL ASSESSMENT			
o Subproject is declined			No
o Subproject is accepted			
o Subproject is classified as environmental Category A and requires an in- depth Environmental and Social Impact Assessment and an Environmental Management Plan.			No
o Subproject is classified as environmental Category B and requires an o Environmental and Social Management Plan.			B
o Subproject is classified as environmental Category C and does not require an Environmental Management Plan.			No

Involuntary Resettlement Screening Checklist

Potential Impacts	Yes	No	Remarks
Does the sub-project involve any physical construction work, i.e.? rehabilitation, reconstruction or new Construction? Specify in "remarks" column.	Yes		It involves construction of new road.
Does the sub-project involve impacts on land, assets, and people, if "Yes" try to quantify the impacts and check following items? If "No" impacts, explain the situation In "remarks" and move to section 2.	Yes		Existing barren land will be used for road construction. Trees will be replaced. Not a single resident is living there. Only impact will be on land by converting it from natural land into road construction.
Potential impacts			
Land (quantify and describe types of land in "remarks Column".	Yes		Land in the sub-project area is generally of mixed nature comprising of fertilized land in half portion along Dina as well as granular and shallow rocky soil starting from Rohtas Road at 800ft onwards. The land is currently zoned as "Undetermined" with no use where only wild bushes are extensively found with few numbers of tress scattered throughout in the sub-project.
Government or state-owned land free of occupation (agriculture or settlement)	Yes		Land owned by Forest Department except 1500ft square which is privately owned.
Private land			1500ft square of total sub-project length
• Residential		No	
• Commercial		No	
• Agriculture		No	
• Communal		No	
• Others (specify in "remarks").			
Land-based assets:			
• Residential structures		No	
• Commercial structures (specify in		No	

"remarks")			
• Community structures (specify in "remarks")		No	
• Agriculture structures (specify in "remarks")		No	No special crops are grown there. Only wild grass and medium sized trees.
• Public utilities (specify in "remarks")		No	
• Others (specify in "remarks")			
Agriculture related impacts			
• Crops and vegetables (specify types and cropping Area in "remarks).		No	
• Trees (specify number and types in "remarks").			Reference letter is attached at
• Others (specify in "remarks").			
Affected Persons (DPs)			
• Number of DPs		No	
• Males		No	
• Females		No	
• Titled landowners	Yes		1500ft land is privately acquired. Revenue record will clarify # of owners of this land, which are believed to be two.
• Tenants and sharecroppers		No	
• Leaseholders		No	
• Agriculture wage laborers		No	
• Encroachers and squatters (specify in remarks column).		No	
Potential Impacts	**Yes**	**No**	**Remarks**
• Vulnerable DPs (e.g. women headed households, minors and aged, orphans, disabled persons, and those below the poverty line). Specify the number and vulnerability in "remarks".		No	
• Others (specify in "remarks")			
Section 2			
Others (specify in "remarks".			

Are there any other minority groups affected by land acquisition or sub-project activities? If "Yes" check the following items		No	No minority group will be affected by the sub-project activity. This sub-project has positive impacts by creating employment for locals.
• Minority groups (specify in "remarks"). Describe nature of impacts		No	

ANNEXURE E: ENVIRONMENTAL MONITORING REPORTS FOR BASELINE DEVELOPMENT

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Head Office: 46-M, Gulberg III, Lahore-Pakistan. Ph: +9242-35441444 Cell: 0303-4442334

TEST REPORT

Ref #: PGG/LAB/2022-2652/AA **Date:** 26-May-22

Name of Industry/Project:	Rohtas Fort Bypass Road
Site Location:	Rohtas Fort Bypass Road, District Jehlum
Nature of Monitoring:	Ambient Air
Monitoring Instrument:	AQMS
Monitoring Coordinates:	32° 58' 11.6" N 73° 34' 51.15"E
Monitoring Date:	16-May-22

Results:

Sr. No.	Time	CO	NO	NO_2	SO_2	PM_{10}	$PM_{2.5}$
		mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
1.	9:00 PM	0.0584	4.092	27.82	33.45		
2.	10:00 PM	0.6306	3.828	28.92	34.55		
3.	11:00 PM	0.6574	6.108	29.79	35.42		
4.	12:00 AM	0.6858	6.072	30.17	35.80		
5.	1:00 AM	0.5432	5.016	30.28	35.91		
6.	2:00 AM	0.5086	1.848	29.21	34.84		
7.	3:00 AM	0.5544	2.376	28.90	34.53		
8.	4:00 AM	0.5856	2.640	28.00	33.63		
9.	5:00 AM	0.6138	3.564	28.99	34.62		
10.	6:00 AM	0.7011	2.508	33.05	38.68		
11.	7:00 AM	0.7886	1.848	30.74	36.37		
12.	8:00 AM	0.8379	2.244	33.86	39.49		
13.	9:00 AM	0.9282	2.376	31.58	37.21	137	38.2*
14.	10:00 AM	0.9606	3.432	33.94	39.57		
15.	11:00 AM	1.0476	1.452	35.25	40.88		
16.	12:00 PM	1.1705	2.244	29.99	35.62		
17.	1:00 PM	1.2195	4.092	30.33	35.96		
18.	2:00 PM	1.3715	3.696	26.85	32.48		
19.	3:00 PM	1.1273	3.564	29.99	35.62		
20.	4:00 PM	1.0599	3.828	31.25	36.88		
21.	5:00 PM	1.0274	3.036	31.51	37.14		
22.	6:00 PM	0.8842	3.234	31.19	36.82		
23.	7:00 PM	0.6359	3.300	26.44	32.07		
24.	8:00 PM	0.6107	3.564	29.25	34.88		
Average (24 Hours)		0.800	3.330	30.30	35.93		
PEQS		**5 8hours**	**40 24hours**	**80 24hours**	**120 24hours**	**150 24hours**	**35 24hours**

.....End of Report.....

PEQS: Punjab Environmental Quality Standards
NGVS: No Guideline Value Set

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Ref #: PGG/LAB/2022-2652/AA **Date:** 26-May-22

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- The report is not valid for any negotiations.
- Dually calibrated instruments were used during monitoring.

Field Analyst	Chief Analyst	Laboratory Incharge

Pak Green Enviro-Engineering (Pvt) Ltd. 46-M, Gulberg-III, Lahore Pakistan

PAK-EPA | PNAC LAB 180 17025

info@pakgreen.pk pakgreen@hotmail.com www.pakgreen.pk

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TEST REPORT

Ref #: PGG/LAB/2022-2692/SW

Issue Date: 7-Jun-22

Name of Industry/Project:	Rohtas Fort Bypass Road
Site Location:	Rohtas Fort Bypass Road, District Jehlum
Nature of sample:	Surface water
Sample Source:	20 ft depth PTEG
Sampling By:	Pak Green Laboratories
Sample Code:	SW-641
Sampling type (Grab/Composite):	Grab
Sampling Coordinates:	32° 58' 7.8123" N 73° 34' 44.360" E
Date of sampling:	1-Jun-22

Results:

Sr. No.	Parameters	Unit	Method / Technique	Results
1.	Total Coli-form	MPN/ 100ml	APHA-9221 D	34.7
2.	Fecal Coliform (Ecoli)	MPN/ 100ml	APHA-9221 E	Nil
3.	Total colony Count	MPN/ 100ml	APHA-9215 B	Nil
4.	Fecal Streptococci	MPN/ 100ml	APHA-9230 B	Nil
5.	Total Hardness ^	mg/L	APHA-2340 C	612
6.	Total Dissolved Solids ^	mg/L	APHA-2540 C	267
7.	pH ^	-	APHA-4500-H^+ B	8.0234 at 23.1°C
8.	Chloride (Cl^{-1}) ^	mg/L	APHA-4500-Cl B	109
9.	Fluoride (F)	mg/L	APHA-4500-F-D	0.6
10.	Nitrate^	mg/L	APHA-4500-NO_3^{-1}-E	25.2
11.	Total Iron (Fe)^	mg/L	APHA-3111 B	0.5290
12.	Carbonates	mg/L	APHA-2320 B	40
13.	Bicarbonates	mg/L	APHA-2320 B	200
14.	Calcium (Ca)	mg/L	3500 Ca-B	230
15.	Magnesium (Mg)	mg/L	3500 Mg-B	11.8
16.	Total Suspended Solids (TSS)^	mg/L	APHA-2540 D	32
17.	Sulphate (SO_4^{2-}) ^	mg/L	APHA-4500-SO_4 E	180

.....End of Report.....

NEQS: National Environmental Quality Standards
WHO: World Health Organization

^ PNAC Accredited

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Ref #: PGG/LAB/2022-2692/SW **Issue Date: 7-Jun-22**

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Lab Analyst	Chief Analyst	Laboratory Incharge

Pak Green Enviro-Engineering (Pvt) Ltd. 46-M, Gulberg-III, Lahore Pakistan

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info@pakgreen.pk pakgreen@hotmail.com www.pakgreen.pk

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TEST REPORT

Ref #: PGG/LAB/2022-2691/DW

Date: 7-June-22

Name of Industry/Project:	Rohtas Fort Bypass Road
Site Location:	Rohtas Fort Bypass Road, District Jehlum
Nature of sample:	Groundwater
Sample Source:	20 ft depth PTEG
Sampling By:	Pak Green Laboratories
Sample Code:	GW-640
Sampling type (Grab/Composite):	Grab
Sampling Coordinates:	32° 58' 7.8123" N 73° 34' 44.360" E
Date of sampling:	1-Jun-22

Results:

Sr. No.	Parameters	Unit	WHO	PEQS	Method / Technique	Results
1.	E Coli	MPN/ 100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	APHA-9221 F	Nil
2.	Total Coli-form	MPN/ 100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	APHA-9221 D	Nil
3.	Fecal Coliform	MPN/ 100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	APHA-9221 E	Nil
4.	Color	TCU	≤ 15	≤ 15	APHA-2120 C	0.000
5.	Taste	-	Non-Objectionable / Acceptable	Non-Objectionable / Acceptable	APHA-2160 C	Non-Objectionable
6.	Odor	-	Non-Objectionable / Acceptable	Non-Objectionable / Acceptable	APHA-2150 B	Non-Objectionable
7.	Turbidity	NTU	< 5	< 5	APHA-2130 B	0.20
8.	Total Hardness ^	mg/L	-	<500	APHA-2340 C	510*
9.	Total Dissolved Solids ^	mg/L	< 1000	< 1000	APHA-2540 C	1216*
10.	pH ^	-	6.5-8.5	6.5-8.5	APHA-4500-H+ B	7.610 at 25.5°C
11.	Aluminum (Al)	mg/L	0.2	≤ 0.2	APHA-3111 D	BDL
12.	Antimony (Sb)	mg/L	0.02	≤0.005	APHA-3111 B	BDL
13.	Arsenic (As)	mg/L	0.01	≤ 0.05	APHA-3114 B	0.0041
14.	Barium (Ba)	mg/L	0.7	0.7	APHA-3111 D	BDL
15.	Boron (B)	mg/L	0.3	0.3	APHA-3111 D	BDL
16.	Cadmium (Cd)^	mg/L	0.003	0.01	APHA-3111 B	BDL
17.	Chloride (Cl^{-1}) ^	mg/L	250	< 250	APHA-4500-Cl B	165
18.	Chromium (Cr)^	mg/L	0.05	≤ 0.05	APHA-3111 B	BDL
19.	Copper (Cu)^	mg/L	2	2	APHA-3111 B	BDL
20.	Fluoride (F)	mg/L	1.5	≤ 1.5	APHA-4500-F- D	1.4

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Ref #: PGG/LAB/2022-02691/DW **Date:** 7-June-22

Sr. No.	Parameters	Unit	WHO	PEQS	Method / Technique	Results
21.	Lead (Pb)^	mg/L	0.01	≤ 0.05	APHA-3111 B	BDL
22.	Manganese (Mn)^	mg/L	0.5	≤ 0.5	APHA-3111 B	0.0037
23.	Mercury (Hg)	mg/L	0.001	≤ 0.001	APHA-3112 B	BDL
24.	Nickel (Ni)	mg/L	0.02	≤ 0.02	APHA-3111 B	BDL
25.	Nitrate^	mg/L	50	≤ 50	APHA-4500-NO_3^{-1}-E	0.014
26.	Nitrite^	mg/L	3	≤ 3	APHA-4500-NO_2^{-1}-B	0.009
27.	Selenium (Se)	mg/L	0.01	0.01	APHA-3114 C	BDL
28.	Residual Chlorine (Cl_2)	mg/L	-	0.2-0.5 at consumer end 0.5-1.5 at source	APHA-Cl-B	0.02
29.	Zinc (Zn)^	mg/L	3	5.0	APHA-3111 B	0.0144
30.	Phenolic Compound (As Phenol)	mg/L	0.002	-	APHA-5530 D	BDL
31.	Sodium (Na)^	mg/L	200	-	APHA-3111 B	20.6847
32.	Potassium (K)^	mg/L	200	-	APHA-3111 B	11.8554

.....End of Report.....

PEQS: Punjab Environmental Quality Standards **WHO: World Health Organization** **BDL: Below Detection Limit**

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TEST REPORT

Ref #: PGG/LAB/2022-02654/NL **Date:** 26-May-22

Name of Industry/Project:	Rohtas Fort Bypass Road.
Site Location:	Rohtas Fort Bypass Road, District Jehlum.
Nature of Monitoring:	Noise Level
Monitoring Time:	Real Time
Monitoring Location:	Project Site
Monitoring Coordinates:	32° 58' 11.6" N 73° 34' 51.15" E
Monitoring Instrument:	Land TEK SL 5868-P
Monitoring Date:	16-May-22

Results:

Sr. No.	Time	Equivalent Noise dB (A)
1.	6:00 PM	62.5
2.	7:00 PM	60.7
3.	8:00 PM	58.5
4.	9:00 PM	59.4
5.	10:00 PM	57.8
6.	11:00 PM	59
7.	12:00 AM	55.7
8.	1:00 AM	54.2
9.	2:00 AM	57.6
10.	3:00 AM	52.3
11.	4:00 AM	50.9
12.	5:00 AM	52.2
13.	6:00 AM	55.7
14.	7:00 AM	56.5
15.	8:00 AM	55.5
16.	9:00 AM	58.5
17.	10:00 AM	51.9
18.	11:00 AM	55.2
19.	12:00 PM	57.1
20.	1:00 PM	55
21.	2:00 PM	56.7
22.	3:00 PM	58.5
23.	4:00 PM	56.8
24.	5:00 PM	62.5
Average		56.7

.....End of Report.....

PEQS: Punjab Environmental Quality Standards

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Field Analyst	Chief Analyst	Laboratory Incharge

Pak Green Enviro-Engineering (Pvt) Ltd. 46-M, Gulberg-III, Lahore, Pakistan

PAK-EPA PNAC LAB 180 17025

info@pakgreen.pk pakgreen@hotmail.com www.pakgreen.pk

ANNEXURE F: CHANCE FIND PROCEDURE

Chance Find Procedures

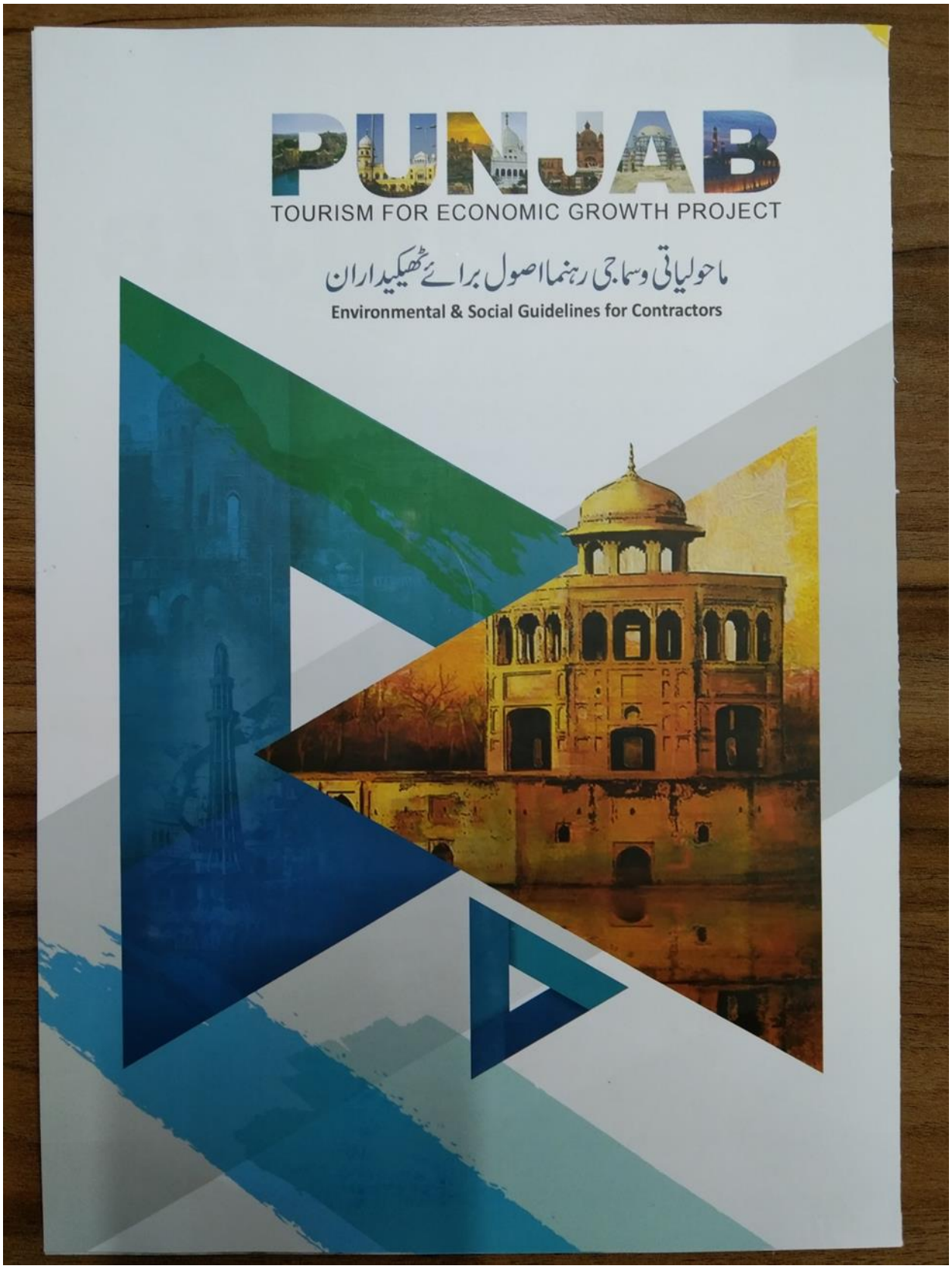
Project may involve deep excavations. Therefore, the possibility of chance find is not ignorable. In case of any chance find, the contractor will immediately report through Supervision Consultant to DG Directorate General of Archaeology, Punjab, to take further suitable action to preserve those antique or sensitive remains. Representative of the Director will visit the site and observe the significance of the antique, artefact and Cultural (religious) properties and significance of the project. The report will be prepared by representative and will be given to the Director. The documentation will be completed and if required suitable action will be taken to preserve those antiques and sensitive remains.

In case any artefact, antiques and sensitive remains are discovered, chance find procedures should be adopted by contractor workers as follows:

- Stop the construction activities in the areas of chance find.
- After stopping work, the contractor must immediately report the discovery to the Supervision Consultant.
- The Director decides to take over the antiquity for purposes of custody, preservation and protection, the person discovering or finding it shall hand it over to the Director or a person authorized by him in writing.
- Delineate the discovered site or area.
- Consult with the local community and provincial Archaeological Department.
- The Director shall, constitute a team of archaeologists for undertaking preliminary investigation and will decide about further course of action in light of findings of the team.
- The suggestion of the local communities and the concerned authorities will be suitably incorporated during taking the preventive measures to conserve the antique, artefact and cultural (religious) properties; and
- Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remain, a night guard shall be arranged until the responsible local authorities take over.
- Avoid the use of heavy construction machinery during the excavation process; and

The Contractor staff must have relevant qualification and experience of similar projects.

ANNEXURE G: ENVIRONMENTAL & SOCIAL GUIDELINES FOR THE CONTRACTOR

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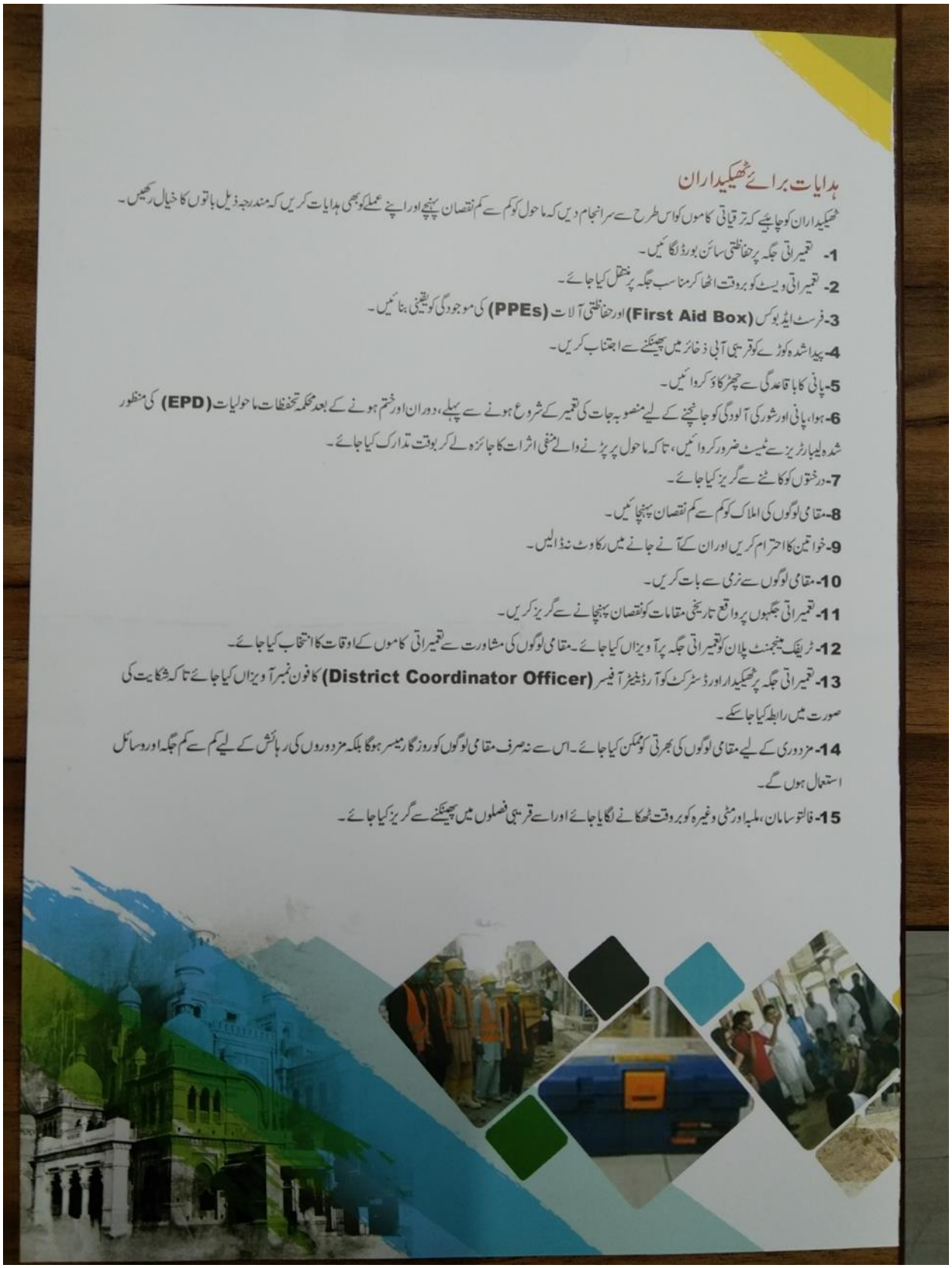
TOURISM FOR ECONOMIC GROWTH PROJECT
تعارف
پلاننگ اینڈ ڈویلپمنٹ بورڈ گورنمنٹ آف پنجاب نے ورلڈ بینک کے تعاون سے پنجاب سیاحتی اقتصادی منصوبہ شروع کیا ہے۔جس کی کل لاگت 55 ملین ڈالر ہے۔اس منصوبے کا مقصد اداروں کی قابلیت کو بڑھانا ہے تا کہ زیادہ سے زیادہ معاشی ترقی، روزگار کے مواقع اور علاقائی تعاون کو فروغ دینے کے ساتھ ساتھ ملک کی تصویر کو بہتر طور پر اجاگر کیا جائے۔
ماحولیاتی اور سماجی مسائل (Environmental & Social Issues)
ٹھیکیدار کسی بھی طرح کے ترقیاتی کاموں میں اہم کردار ادا کرتے ہیں۔ Punjab Tourism for Economic Growth Project (PTEGP) کے تحت بننے والی تمام سڑکیں اور منسلک ترقیاتی کاموں کے پیش نظر ٹھیکیداران کے لیے Guidelines بنائی گئی ہیں۔تا کہ ترقیاتی کاموں کے دوران پیدا ہونے والے ماحولیاتی اور سماجی مسائل کو مناسب طریقوں سے حل کیا جائے۔ان کا مقصد ٹھیکیداران کو نہ صرف آگاہی دینا ہے بلکہ احتیاطی تدابیر اپنا کر ماحول پر پڑنے والے اثرات کو کم بھی کرنا ہے۔
ترقیاتی کاموں میں تھوڑی سی بے احتیاطی ماحول کے حُسن کو بگاڑنے میں اہم کردار ادا کر سکتی ہے۔اس سے نہ صرف ماحول متاثر ہوگا بلکہ جانور اور پودے بھی متاثر ہو سکتے ہیں۔ٹھیکیداران معلومات کی کمی کی وجہ سے ماحول میں بگاڑ پیدا کرنے کے ذمہ دار ہو سکتے ہیں۔یہی وجہ ہے کہ ان Guidelines کو ترتیب دیا گیا ہے۔تا کہ ماحول کے اس بگاڑ کو کم سے کم کیا جائے۔
ماحولیاتی اور سماجی مسائل کی مختلف اقسام ہیں
1-ہوا کی آلودگی، گرد و غبار (Air/Dust Pollution)
2- کوڑے کا جمع ہونا (Garbage Heaps)
3-شور وغُل (Noise Pollution)
4- مٹی کا اُڑنا (Dust Pollution)
5-کیمپ سائٹ یا خیمہ کی غیر مناسب جگہ پر موجودگی (Wrong Selection of Camp Site)
6-درختوں اور پودوں کا کاٹنا (Cutting of Trees & Plants)
7-رہائشیوں کو آنے جانے میں دقت (Public Constraints)
8-ٹریفک میں رُکاوٹ
9-لڑائی جھگڑے (Public Conflicts)
10-رہائشی خواتین کے پردے اور پرائیویسی کے مسائل (Women Privacy Issues)
11-ملبہ اور فالتو سامان کھیتوں میں پھینکنا (Illegal Throw of Waste)
12-اِردگرد موجودہ دکانداروں کا راستہ بند ہونے سے معاشی نقصان (Economic Loss)
13-اردگرد سکولوں، کالجوں اور ہسپتالوں وغیرہ کا راستہ بند ہو جانے کی وجہ سے آنے جانے میں پریشانی (Passage Blockage)



ہدایات برائے ٹھیکیداران

ٹھیکیداران کو چاہیئے کہ ترقیاتی کاموں کو اس طرح سے سرانجام دیں کہ ماحول کو کم سے کم نقصان پہنچے اور اپنے عملے کو بھی ہدایات کریں کہ مندرجہ ذیل باتوں کا خیال رکھیں۔

1- تعمیراتی جگہ پر حفاظتی سائن بورڈ لگائیں۔

2- تعمیراتی ویسٹ کو بروقت اٹھا کر مناسب جگہ پر منتقل کیا جائے۔

3- فرسٹ ایڈ بوکس (First Aid Box) اور حفاظتی آلات (PPEs) کی موجودگی کو یقینی بنائیں۔

4- پیدا شدہ کوڑے کو قریبی آبی ذخائر میں پھینکنے سے اجتناب کریں۔

5- پانی کا باقاعدگی سے چھڑکاؤ کروائیں۔

6- ہوا، پانی اور شور کی آلودگی کو جانچنے کے لیے منصوبہ جات کی تعمیر کے شروع ہونے سے پہلے، دوران اور ختم ہونے کے بعد محکمہ تحفظات ماحولیات (EPD) کی منظور شدہ لیبارٹریز سے ٹیسٹ ضرور کروائیں، تاکہ ماحول پر پڑنے والے منفی اثرات کا جائزہ لے کر بوقت تدارک کیا جائے۔

7- درختوں کو کاٹنے سے گریز کیا جائے۔

8- مقامی لوگوں کی املاک کو کم سے کم نقصان پہنچائیں۔

9- خواتین کا احترام کریں اور ان کے آنے جانے میں رکاوٹ نہ ڈالیں۔

10- مقامی لوگوں سے نرمی سے بات کریں۔

11- تعمیراتی جگہوں پر واقع تاریخی مقامات کو نقصان پہنچانے سے گریز کریں۔

12- ٹریفک مینجمنٹ پلان کو تعمیراتی جگہ پر آویزاں کیا جائے۔ مقامی لوگوں کی مشاورت سے تعمیراتی کاموں کے اوقات کا انتخاب کیا جائے۔

13- تعمیراتی جگہ پر ٹھیکیدار اور ڈسٹرکٹ کوآرڈینیٹر آفیسر (District Coordinator Officer) کا فون نمبر آویزاں کیا جائے تاکہ شکایت کی صورت میں رابطہ کیا جا سکے۔

14- مزدوری کے لیے مقامی لوگوں کی بھرتی کو ممکن کیا جائے۔ اس سے نہ صرف مقامی لوگوں کو روزگار میسر ہوگا بلکہ مزدوروں کی رہائش کے لیے کم سے کم جگہ اور وسائل استعمال ہوں گے۔

15- فالتو سامان، ملبہ اور مٹی وغیرہ کو بروقت ٹھکانے لگایا جائے اور اسے قریبی فصلوں میں پھینکنے سے گریز کیا جائے۔


WORLD BANK GROUP
Project Management Unit
Punjab Tourism for Economic Growth Project
Planning & Development Board,
Government of the Punjab
175-A Upper Mall Scheme, Scotch Corner (Behind NIPA), Lahore
+ 92-42-993326-7-8
www.ptegp.punjab.gov.pk

ANNEXURE H: SOPS FOR CARRYING OUT REHABILITATION WORK NEAR HERITAGE SITE ROHTAS FORT

The existing road rehabilitation work near the Rohtas Fort boundary wall. A Standard Operating Procedures are developed for executing the proposed road rehabilitation work and presented in this annexure. All parties of the project i.e. Contractor, Consultant, Client or any other sub-contractor (delivery contractor, individual service provider etc.) must adhere these standards.

The Contractor shall be bound to:-

- Ensure that no damage or adverse effect is caused to archaeological sites, graveyards and burial places.
- Historical buildings/structres must not be used for any project activities e.g. using as rest area, keeping material inside the structure etc.
- All work activities must be performed during day light including material delivery etc. in order to avoid any accidental damage of the historical sites.
- Ensure that no damage or disruption is caused to the social infrastructure or public services e.g. restaurants, offices of Archeological Department, education, health, electricity supply, drinking water supply, and facilities for public gathering or religious congregations.
- Ensure that existing ownership of land around the project site is respected.
- The consultant's environmental team will maintain a social complaint register at site office to document all complaints received from the local communities. The register will also record the measures taken to mitigate these concerns.
- The Contractor shall be contractually bound to not to allow or cause discharge spill or dumping on any building, house, graveyard, archaeological site (established or newly found), unstable slopes, un-compacted embankment or leakage of material/waste into the construction area. Any such failure shall be duly noted by Supervision Consultant during site inspections and contractor shall immediately remedy the situation.
- The Contractor shall ensure that his construction machinery is always in first class working order and no spilling of Diesel or any other fluids into the surrounding environment, is caused by the defective machinery of the Contractor.
- The Contractor shall not cause deterioration of air quality by using old or ill maintained machinery which raise excessive dust, produce excessive smoke or cause excessive noise pollution. The Contractor shall follow strict standards of maintenance of machinery, provide qualified and trained drivers and operations for the vehicles. The Contractor shall also sprinkle water on earthen (kacha) roads to be used as link roads, and sites where the earth is to be dumped. The Contractor shall provide protective masks to his work force.
- The Contract shall ensure that:-
- Unnecessary and out of bound activities/movements are not done outside the area allotted to the contractor for setting-up his facilities, material depots and machinery yard etc.
- No fire arms are carried by any of the employees or labour, except security staff.
- All Environment, Labour, Forest, Wildlife and Fisheries Laws are fully respected and abided by the Contractor and his work force.
- The Biodiversity is respected and saved on its terrestrial, aquatic and aerial habitats.
- Necessary sign boards indicating boundaries of the work area are displayed to make labour, visitors and members of public to remind them of their obligations towards Biota.
- Inspections by Labour, Wildlife, Forest and Fisheries Officers are facilitated in camps to facilitate a proper implementation of relevant Laws.
- Specified speed limits must be followed by project traffic.
- The Contractor shall carry out a walk over survey before clearing the land from natural vegetation and relocate any bird nest or wildlife habitat e.g. rabit hole find in the area etc.
- The Contractor shall get prior approval from supervision consultant for any tree cutting or

uprooting require for the project.

- The Contractor shall:-
- Put up temporary but prominent sign boards in all of the project activity area warning people against likely hazards which can be caused due to certain activities.
- Ensure proper housekeeping and cleanliness conditions are maintained at work area by ensuring proper drainage and suitable disposal of solid waste.
- Provide PPE specified in the risk assessment or health and safety plan e.g. helmet, field boots, earplugs and others gears at work site as a precaution against any mishap, and interlink various parts of the construction complex with local wireless telephones, which may also be fitted in the vehicles.