LAO PEOPLE'S DEMOCRATIC REPUBLIC

PEACE INDEPENDENCE DEMOCRACY UNITY PROSPERITY

MINISTRY OF PUBLIC WORKS AND TRANSPORT

DEPARTMENT OF ROADS

The Southeast Asia Regional Economic Corridor and Connectivity Project (P176088)

FEASIBILITY STUDY AND ENVIRONMENT AND SOCIAL ASSESSMENT (ESA) STUDY FOR IMPROVEMENT AND MAINTENANCE OF NATIONAL ROAD 2

National Road Climate Resilient Improvement and Maintenance in NR2

Environmental and Social Management Plan (ESMP)

-NR2E-

CONSULTANT:

DONG IL ENGINEERING CONSULTANTS

DONGSUNG ENGINEERING

LAO TRANSPORT ENGINEERING CONSULTANT

SEPTEMBER 2023

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATION AND ACRONYMS

Acronyms/Abbreviations	Definition
AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ACM	Asbestos Containing Materials
ADB	Asian Development Bank
AHN	Asian Highway Network
AOI	Area of Influence
A-RAP	Abbreviated Resettlement Action Plan
ASEAN	Association of Southeast Asian Nations
AZE	Alliance for Zero Extinction
BAP	Borrow Pit Action Plan
BMP	Biodiversity Management Plan
BOD	Biological Oxygen Demand
BOQ	Bill of Quantities
CDC	Concept Design Consultants
CESMP	Contractors Environmental and Social Management Plan
CHIRPS	Climate Hazards Group InfraRed Precipitation with Station data
CHS	Community Health and Safety
CITES	Convention on International Trade in the Endangered Species of Fauna and Flora
CMUs	Component Management Units
CO	Carbon Monoxide
CO2	Carbon Dioxide
COD	Chemical Oxygen Demand
COI	Corridor of Impact
CR	Critical
CVMP	Construction Vibration Management
DAFO	District of Agriculture and Forestry
DBST	Double Bituminous Surface Treatment
DD	Detailed Design
DDMCC	Department of Disaster Management and Climate Change
DEQP	Department of Environmental Quality Promotion
DFP	Department of Financial and Planning
DFRM	Department of Forest Resources Management
DMH	Department of Meteorology and Hydrology
DOA	Department of Organization and Administrative
DoE	Department of Environment
DoI	Department of Inspection
DoL	Department of Land
DoNREI	Department of Natural Resources and Environmental Inspection
DoR	Department of Roads
DoT	Department of Transport
DPC	Department of Planning and Cooperation
DPWT	Provincial Department of Public Works and Transport
DWR	Department of Water Resources

Acronyms/Abbreviations	Definition
E&S	Environmental and Social
EA	Environmental Assessment
EGEF	Ethnic Groups Engagement Framework
EGEP	Ethnic Group Engagement Plan
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EIB	European Investment Bank
ELV	Emissions Limits Values
EN	Endangered
ENSO	El Niño Southern Oscillation
EPL	Environmental Protection Law
ERP	Emergency Response Plan
ESCP	Environment and Social Commitment Plan
ESD-PTI	Environmental and Social Division of the Public Works and Transport Institute
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environment and Social Management
ESMMP	environmental and social management and mitigation plan
ESMP	Environmental and Social Management Plan
ESOM	Environmental and Social Operational Manual
ESS	Environmental and Social Standard
EU	European Union
FAO	Food and Agriculture Organization
FDF	Forest Development Fund
FS	Feasibility Study
GAP	Gender Action Plan
GBV	Gender Based Violence
GDP	Gross Domestic Product
GIIP	Good International Industry Practice
GOL	Government of Laos
GRM	Grievance Redress Mechanism
HC	Hydrocarbons
HPP	Hydropower Plant
IBA	Important Bird Area
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature and Natural Resources
KBA	Key Biodiversity Areas
LCF	Local Consulting Firm
LFNC	Lao Front for National Construction
LFND	Lao Front for National Development
LHS	Left Hand Side
LMP	Labour Management Plan
MAC	Maximum Allowable Concentrations

Acronyms/Abbreviations	Definition
MAF	Ministry of Agriculture and Forestry
MOF	Ministry of Finance
MONRE	Ministry of Natural Resources and the Environment
MPAC	Master Plan for ASEAN Connectivity
MPI	Ministry of Planning and Investment
MPWT	Ministry of Public Works and Transport
MSDS	Material Safety Data Sheet
NBCA	National Biodiversity Conservation Areas
NDF	Nordic Development Fund
NEC	National Environmental Committee
NES	National Environmental Specialist
NGO	Non-governmental Organization
NMRCS	National Mekong River Commission Secretariat
NO	Nitrogen Oxide
NO2	Nitrogen Dioxide
NOX	Nitrogen Oxides
NPA	Nationally Protected Area
NR2E	National Road 2 East
NR2W	National Road 2 West
NRERI	Natural Resources and Environmental Research Institute
NSCC	National Strategy on Climate Change
O&M	Operation and Maintenance
OCHA	The Office for the Coordination of Humanitarian Affairs
OHS	Occupational Health and Safety
OP	Operational Policy
OPBRC	Output- and Performance-Based Road
OPWT	Office of Public Works and Transport
PAFO	Provincial Office of Agriculture and
PAFO	Provincial Office of Agriculture and Forestry
PAPs	Protected Areas
PCR	Physical Cultural Resources
PDO	Project Development Objective
PDR	Peoples Democratic Republic
PEC	A Provincial Environmental Committee
PFS	A pre-feasibility study
PKK	Phou Khao Khoay
PM	Particulate Matter
PM10	Particulate Matter less than 10 Microns
PMU	Project Management Unit
PONRE	Provincial Department of Natural Resources and Environment
PPE	Personal Protective Equipment
PPIAF	Public Private Infrastructure Advisory Facility
PPN	Phou Phanang
PPP	Public-private Partnership
PtFAs	Protection forestland areas
PTI	Public Works and Transport Institute

Acronyms/Abbreviations	Definition
RAP	Resettlement Action Plan
RC	Resettlement Committee
RHS	Right Hand Side
ROW	Right of Way
RPF	Resettlement Planning Framework
SEA/SH	Abuse/Sexual Harassment
SEP	Stakeholder Engagement Plan
SIDA	Swedish International Development Cooperation Agency
SO2	Sulphur Dioxide
SO2	Sulphur dioxide
STD	Sexually Transmitted Disease
TMP	Traffic Management Plan
ToR	Terms of Reference
TSP	Total Suspended Particulate
UN	United Nations
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States Dollar
UXO	Unexploded Ordnance
VAC	Violence Against Women
VU	Vulnerable
VUDAA	Vientiane Urban Development and Administration Authority
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization
WMP	Waste Management Plan

Units of Measurement

Unit	*Definition*
dBA	*Decibel, A-weighted*
Km	*Kilometer*
Km/h	*Kilometers per hour*
Laeq	*Equivalent Continuous Sound Pressure Level*
M	*Meter*
Mg/kg	*Milligrams per kilogram*
M3	*Cubic Meter*
m3/s	*Cubic Meters per Second*
Ppm	*Parts per million*
µg/m3	*Micrograms per cubic meter*

1. INTRODUCTION

The Government of Loa PDR (GoL) has identified the need to improve (including widening, rehabilitation, and reconstruction) the existing NR2, in Northwest Lao PDR, Oudomxay / Phongsaly province. NR2 is about 295 km in length, comprising NR2 West (NR2W, 145 km) and NR2 East (NR2E, 150 km).

Environmental and Social Management Plans have been prepared for both NR2W and NR2W. This ESMP relates to NR2E.

GoL, through the Ministry of Public Works and Transport (MPWT) intends to improve the NR2, using as an Output- and Performance-Based Road Contract (OPBRC), with a 10-year contract life, including an estimated 3-year construction phase.

The Project is aligned to Lao national policies and is also important from a regional development perspective, as it provides a link from Thailand to Vietnam through Northern Lao PDR. NR2 is one of the few remaining routes of the Asian Highway Network (AHN) which still falls below the minimum ASEAN Highway Standards. The road improvement is also seen as necessary to support the daily livelihood of local communities who rely on it and to allow them to potentially benefit from future economic growth resulting from the Lao - China HSR station located at Muang Xai, Oudomxay Province.

MPWT is considering using international financing within the scope of the construction works of the Project. An Environmental and Social Impact Assessment (ESIA) study has been carried out to meet the environmental and social requirements of World Bank and the European Investment Bank (EIB). Within the scope of ESIA studies, the Consultant has prepared an ESIA Package containing the following documents:

- Environmental and Social Impact Assessment (ESIA)
- Biodiversity Management Plan (BMP)
- Stakeholder Engagement Plan (SEP)
- Resettlement Action Plan (RAP)
- Labour Management Plan
- Gender Action Plan (GEP)
- Environmental and Social Management Plan (ESMP)

In the ESIA process, the necessary environmental and social risks and impacts arising from the Project have been assessed, and necessary measures have been introduced to manage impacts in accordance with national legislation, international standards and guidance documents, and through the adoption of good international industry practices. The ESIA Report consists of the following key components, each of which is described in detail:

- Description of the project
- Institutional and legal framework
- Environmental and social baseline
- Environmental and social impact assessment
- Analysis of alternatives

Environmental and Social Management Plan (ESMP), which is one of the documents submitted within the scope of the ESIA package, describes the measures and controls developed in line with the mitigation hierarchy for the management of the impacts identified during the ESIA process, determines the implementation schedule, roles and responsibilities, reporting and monitoring requirements. The mitigation and monitoring plans included in this ESMP, defines the environmental and social mitigation measures and management controls to be implemented in order to ensure compliance with the Project Standards presented under ESIA Report on relevant environmental and social issues.

MPWT and all contractors / sub-contractors are responsible for the implementation of the ESMP and the general principles presented within the scope of the ESMP, as well as for the implementation of more detailed plans and procedures.

1.1. Purpose and Scope

The purpose of ESMP is to provide the necessary management tools to ensure compliance with the Project standards in achieving the environmental and social objectives set within the scope of ESIA. Besides the legal and institutional requirements for the successful implementation of the relevant management plans, ESMP also determines the roles and responsibilities of MPWT and the contractor / sub-contractors. The main objectives of ESMP are as follows:

- To provide an overview of the environment, health and safety (EHS), socio-economic and cultural heritage policies, standards and legal legislation that the Project is obliged to comply with.
- To provide guidance on how to manage EHS risks in the construction phase of the Project in compliance with EHS policies, standards and legal regulations and to ensure that Project commitments are fulfilled.
- To determine the roles and responsibilities of MPWT and contractors to ensure compliance with EHS requirements during the construction phase of the project.
- To ensure that construction activities are properly checked to ensure that the Project is in compliance with EHS policies, standards and legal regulations.
- Ensure reporting systems are developed and streamlined to deliver EHS compliance performance.
- Enabling ongoing development and EHS compliance coverage.

1.2. Environmental and Social Management Plan Structure

Subjects covered within the scope of the ESMP are presented under the following chapters:

- **Introduction:** The section in-hand.
- **Project Description:** Summary information about project activities, duration and cost of the project.
- **Project Standards:** Summary of key national legislation, EIB, World Bank and IFC standards EHS documents.
- **Implementation Plan:**
- **Mitigation Plan**: Provides the Project mitigation measures and the responsible parties for implementation.
- **Monitoring Plan:** Provides the Project E&S monitoring plans and responsibilities.

2. PROJECT DESCRIPTION

NR2E covers three districts as Muang Xai and Lah District, in Oudomxay Province and Khua District in Phongsaly Province. The alignment is 99.052km in length and divided into two contracts, or 'Package' Package 1: National Road 2 East (Km 0+000 to Km 52+200) & Package 2: National Road 2 East (Km 52+200 to Km 99+052). The Muang Xai Bypass, 8km, is also included within the scope of NR2E works.

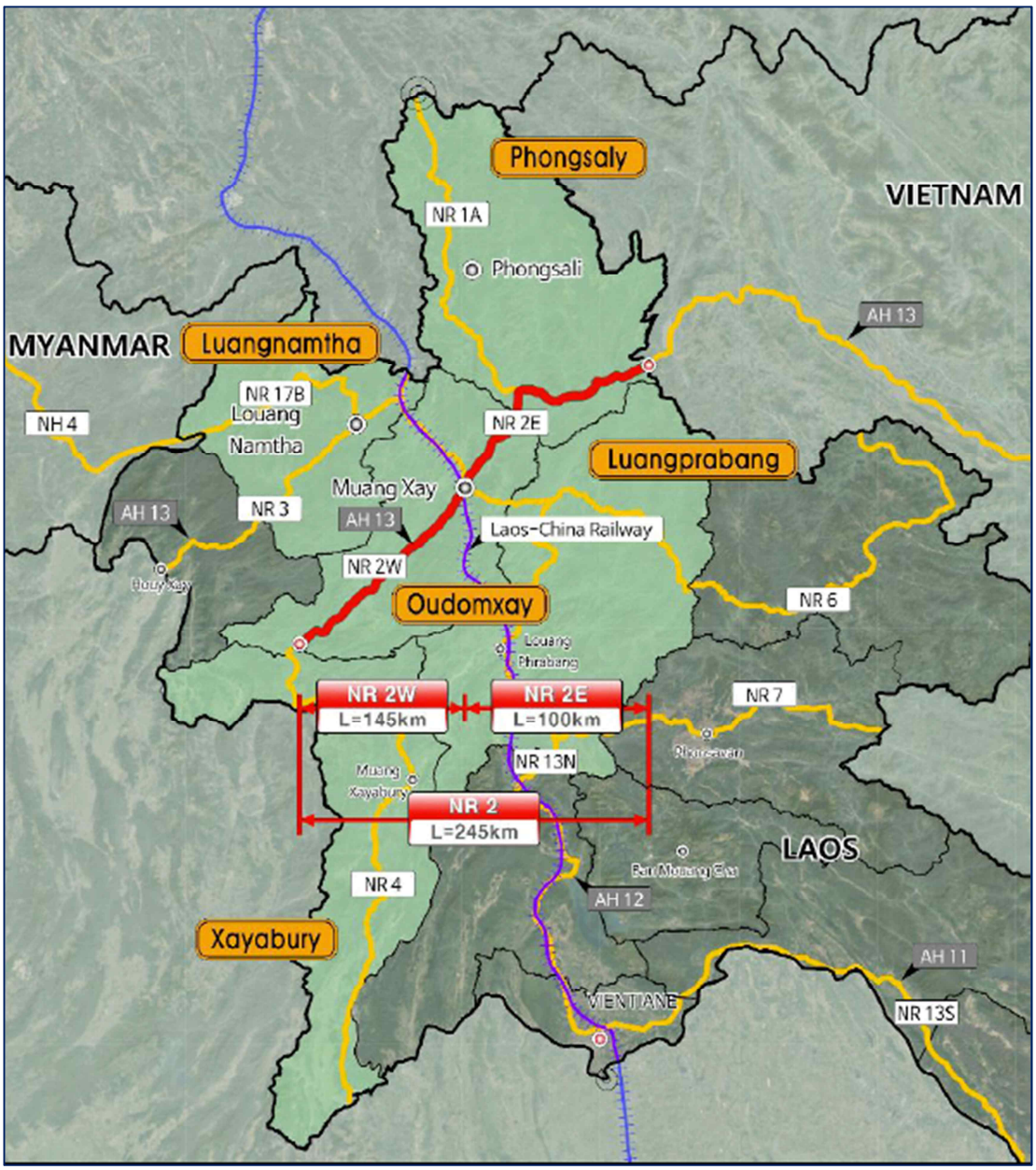

Figure 1: Project Location, NR2E & NR2W

Road works involve bringing the existing road to a minimum width as below:

- Mountainous terrain: Widening existing road width to 8.0 meters: traffic lanes 3.0x2, shoulders 1.0x2, and provided reinforced concrete U-Ditch or trapezoidal ditch liner in village area and the area where the gradient ≥ 4%.

- Some section through to village area is only extend to 7.0 meter: traffic lanes 3.0x2, shoulders 0.5x2. and provided reinforced concrete U-Ditch with top cover for pedestrian sidewalk.
- Flat and Rolling terrain: Widening existing road width to 9.0 meters: traffic lanes 3.0x2, shoulders 1.5x2, and provided reinforced concrete U-Ditch or trapezoidal ditch liner in village area and the area where the gradient ≥ 4%.
- In case of urban areas, if the width cannot be maintained at 9m due to the important impacts, the Solutions by Install the Rumble Strips and Calming sign.

It will also include pavement strengthening, shoulder improvement, embankment improvement, provision and improvement of drainage structures. Following the principles established in the project's resettlement framework, the effort will be made to restrict all improvement works within the existing right-of-way to minimize land acquisition and resettlement.

As required by the DOR-MPWT, Road Class III in rolling and mountain terrain is applied for geometric design of this project, However, as specified in ToR the scope of this project is maintenance and spot improvement only, horizontal alignment and vertical alignment mostly follow the existing road. Improvements shall only be done at necessary locations. The Project has therefore adopted flexible pavement by applying a blend of AASHTO Guide for Design of Pavement Structures 1993 and Road Design Manual (2018.8) of the MPWT, as shown in the table below.

Table 1: Project Road Standard

Category	Unit	Application			
		Urban		Flat to rolling	Mountainous
No. of lanes	Lane	2-way, 2-lane		2-way, 2-lane	2-way, 2-lane
Total width	M	9.6 – 10.6	11.6	7.0-9.0	
Carriage way	M	2@3.0 =6.0	2@3.0 =6.0	2@3.0 =6.0	2@3.0 =6.0
Road shoulder	M	0.5 -1.0	1.5 + U-ditch	0.5-1.5	0.5-1.0
Sidewalk	m	2@0.8=1.6	2@0.8=1.6	-	-

Typical cross sections are shown in the figures below.

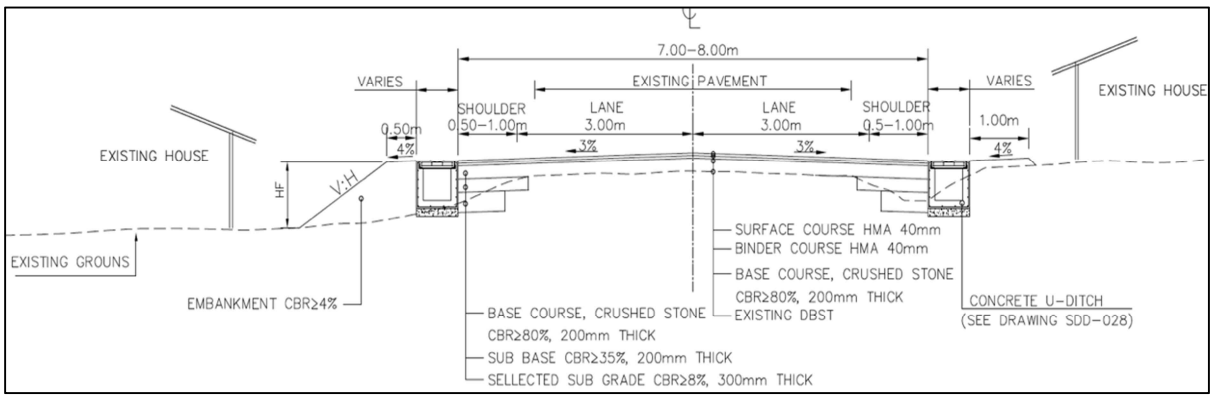

Figure 2: Cross Section Through Village Area (TC1)

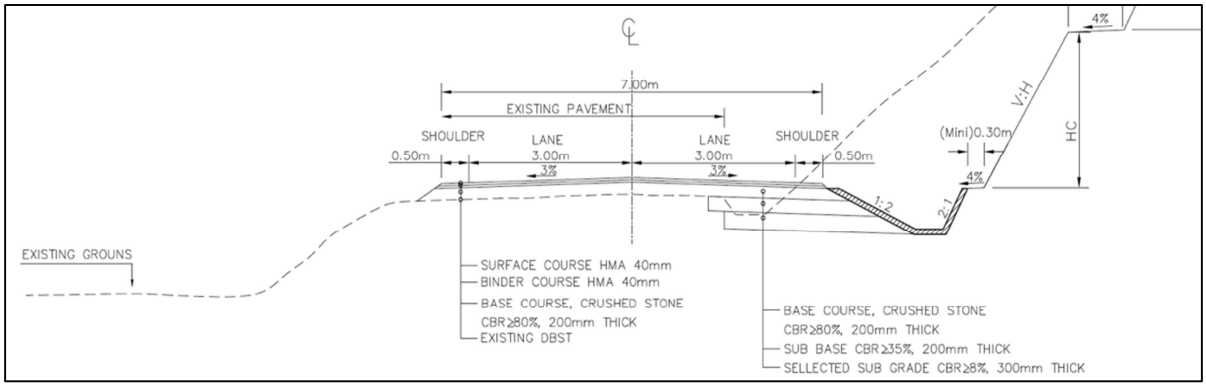

Figure 3: Cross Section Non-village and Mountainous Area (TC4)

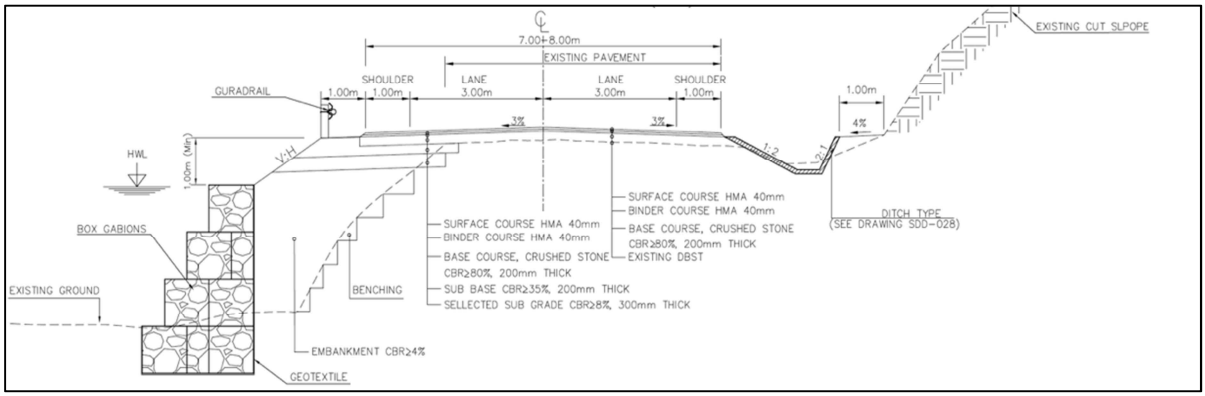

Figure 4: Cross Section Along the River (TC5)

Pavement design has proposed flexible pavement type use of Hot Mix Asphalt for surface course, in village area and gravel road for non-village area the pavement design is based on a 15 years design life. The thickness design is varied depends on the traffic volume.

Table 2: Pavement Design

Sections	Design	Surface	Base Course CBR>80 (mm)	Subbase Course CBR>35, (mm)		Selected Sub-Grade
	ESA	course		Calculated	Design	CBR>8 (mm)
Muang xai Bypass Route	0.9×10^6	HMA 2 layers 8(4+4)cm	200	157	200	300
NR2E (Muang Xai to Muang Khua)	2.3×10^6	HMA 2 layers 8(4+4)cm	200	196	200	300

The specification for Bridge Design is based on AASHTO LRFD 2007 and the Road Design Manual of Ministry of Public Works and Transport (Lao PDR) 2018. The following tables show the bridges and required works.

Table 3: NR2E Bridges

#	Station	Bridge name	Exiting Bridge		New Bridge		Type of Bridge	Province
			Length (m)	Width (m)	Length (m)	Width (m)		
1	14+432	Nam Lia	11.2	6	18	10.7	I-Girder	Oudomxay
2	27+762	Nam Pak	55	6	69	10.7	I-Girder	Oudomxay
3	55+393	Nam Lan	6	11.5	Preserved		Arch Box	Phongsaly
4	63+199	NamNoy	50.4	6	54	10.7	I-Girder	Phongsaly
5	68+674	Nam Bon	28.2	7	33	10.7	I-Girder	Phongsaly
6	74+309	NamSangnin	19.5	6	25.7	10.7	I-Girder	Phongsaly
7	78+069	Nam San	28.2	6	33	10.7	I-Girder	Phongsaly

Box 1: Road Safety in Design

Road safety has been considered in a comprehensive way through all aspects in the design of highways. The safety features that were used in the project road design are as follows:

- *Provision of a wider (0.5 to 2 meters depending on proposed road standard) sealed shoulder and side walk in community areas;*
- *Provision of Bus Bay and public parking area at road side where there is suitable space;*
- *Improvement of poor sight distances;*
- *Improved horizontal geometry by providing curve widening at on all sharp curves;*
- *Traffic Calming, Amber flashing where these should be provided;*
- *Road signs such as warning, information and direction signs, especially at curves less than 50 kph and installation of chevron signs;*
- *Raised pavement markers and provision of rumble bars on pavement at small radius curves;*
- *Lane Markings consist of centerline, edge line and pedestrian crossing;*
- *Speed bumps and/or rumble strip at the entrance of populated area and through the towns;*
- *Chicanes, physical traffic islands constructed on the shoulders to reduce speeds to the desired level, where the road passes through communities;*
- *Traffic islands and channelization at key intersection; and*
- *Guardrails provided on bridge approaches, box culverts and area where sharp curves, and high embankments;*
- *Provides chevron sign, audio tactile line at edge line and centreline on hazardous curves and where suspect incident.*

Material used for road embankments and pavement layers will be procured from borrow pits. The material can be divided as soils, sands and silts, clay, and gravel.

- NR2E: 3 borrow pits sites, 2 rivers gravels sites, 3 river sands and 1 quarry site have been found for possible sources for the project. These soil materials are primarily characterized as clayey sand some gravels, silty gravels, clayey laterites, poorly graded sand and poorly gravel sand, well graded sands and gravel sands, crushed rhyolite. This shows that the project site should not have a problem for the necessary materials for subgrade and sub-base construction.

The locations of the extraction points for non-potable water have yet to be determined, although they should be approved by the Engineer prior to the start of extraction. Potable water will also need to be sourced for construction camps, the requirements of which are discussed as part of the Projects ESMP.

Camp sites will be selected keeping in view the availability of an adequate area for establishing campsites, including parking areas for machinery, stores and workshops, access to communication and local markets, and an appropriate distance from sensitive areas in the vicinity. Final locations will be selected by the Contractor after the approval from the Engineer.

The area requirement for construction camps will depend upon the workforce deployed and the type and quantity of machinery mobilized. In view of the area required, it will not be possible to locate campsites within the ROW and the contractors will have to acquire land on lease from private landowners. The construction camp will have facilities for site offices, workshop and storage yard, and other related facilities including fuel storage. The Contractor will provide the following basic facilities in the construction camps:

- Safe and reliable water supply.
- Hygienic sanitary facilities and sewerage system.
- Treatment facilities for sewerage of toilet and domestic wastes
- Storm water drainage facilities.
- Sickbay and first aid facilities.

Detailed criteria for siting of construction camps and establishment of facilities are given in this ESMP.

Temporary storage areas will be required for certain activities, such as the storage of sand and gravels and construction equipment. These storage areas may range in size from anything between 50 m^2 to more than a hectare. The precise locations of these temporary facilities are not known at this stage, as such mitigation measures will be prepared to ensure that these areas are sited in approved locations.

The road will be kept open throughout construction. Some diversions may potentially be required during the construction phase around key work zones, notably at bridge sites and these diversions are discussed below in Section 3 of the ESIA. The scope of all other diversions will be determined by the Contractor.

3. PROJECT STANDARDS

The Project will conform to the legal and administrative requirements of Lao PDR. The Project will also conform to international treaties to which the Lao PDR is signatory, and to standards of the EIB and World Bank.

In addition to the ESIA and ESMPs prepared to meet the requirements of EIB, World Bank and MPWT is also preparing an IEE in line with national requirements and the Decree on Environmental Assessment (2021). As such both lenders and national requirements for environmental assessment are fulfilled as part of this project.

3.1. Key Legislation

In Lao PDR, many laws and regulations governing the utilization and management of natural resources management (land, forest, water, aquatic and wildlife, etc.) were established in the late 1990's, and many of these have been updated and/or revised. On environment, the Environmental Protection Law (EPL) was first established in 1999 and then revised in 2012 to cope with the needs of socio-economic development. This law was the key law governing environmental protection and management describing the principles, regulations, and measures for managing, monitoring, restoring, and protecting the environment especially those related to protection of human health, natural resources, and the biodiversity as well as a reduction in global warming.

The inclusion of environmental considerations in road projects has been mandated since 1999. The Road Law requires road construction to be undertaken in accordance with public safety and environmental protection considerations, while the Environmental Protection Law (EPL-1999, 2012), supported by its Implementing Decree (2002), as the country's principal environmental legislation. An Environmental Impact Assessment (EIA) is required for roads and other development projects under the Environmental Protection Law.

The key laws and legislations relevant to environment and social impact assessment and mitigation for NR2 are described below.

3.1.1. Environmental Protection Law (2012).

The revised Environmental Protection Law (National Law 29/NA) (EPL) is dated December 18, 2012. The revised Environmental Protection Law has 13 parts and 99 articles. This Environmental Protection law defines principles, regulations and measures related to environmental management, monitoring of protection, control, preservation and rehabilitation, in order to ensure environmental quality, reduction of impacts and pollution created by human activities or by nature, aiming to provide balance between social and natural environment, to sustain and to protect natural resources and public health; contribute to the national socio-economic development and reduce of global warming.

3.1.2. Decree on Environmental Impact Assessment (2021)

In general, this degree defines rules, regulations and measure on management and monitoring of environmental impact assessment activities to make sure that such activities are correctly proceeded with transparency and unity aiming to protect, mitigate and remedy environmental impacts and ensure, ensuring compensation is reasonable and livelihood restoration of affected people is better than before, making management and use of natural resources is efficient, contributing to the implementation of the National and Social Economic Development Plan with a green and sustainability.

It is required by the degree that any impacts caused by an investment project have to evaluate potential impacts on social and natural environment including consideration of all potential problems that may be caused by climate change. An environmental management and monitoring plan must be prepared together with the comprehensive environmental impact assessment report.

3.1.3. Regulation on EIA of Road Project in Lao PDR (2004)

This regulation clarifies the principles and methodologies for environmental impact assessment of road projects, including setting out necessary and appropriate mitigation measures to avoid or reduce negative environmental impacts on the natural environment and society resulting from the implementation of road projects in the Lao PDR.

3.1.4. Forestry Law (2019)

The revised Forestry Law, No. 64/NA (June 2019) determines the principles and regulations and regulates the management, protection, development, utilization and inspection of forests and forestland, promoting tree plantations, regenerating and increasing forest resources. It also aims to enrich forest resources, increase forest cover, enhance tourism and sustainable use in people's livelihoods; ensure the protection of soil quality, air quality, water sources, biodiversity, and environmental protection in a green and sustainable manner; and contribute to national socio-economic development.

The revised Forest Law states that "forests are invaluable national resources with a unique ecology, comprising biodiversity, water sources and land with various tree species growing naturally or planted in an area of at least zero point five (0.5) hectares and a crown cover of at least 20 percent (20%)".

Both natural forest and forested land are the property of the Lao Nation. The State is the designated authority to centrally manage forest and forested lands in a uniform manner throughout the country with the participation of all organizations and the people in the management, protection and utilization of forests and forested land in accordance with the law.

Box 2: Forest Categories

In general, forest is Lao PDR have been categorized in three types: Protection forests, Conservation Forests, and Production Forests. Each forest category may consist of areas of dense forest, dry dipterocarp forest, regeneration forest, and degraded forest.

- ***Protection Forests*** *are forests classified for the function of maintaining water, riverbanks and roadsides, for preventing soil erosion and improving soil quality, strategic areas for national defence and security, safeguarding against natural disasters and providing environmental protection and other functions.*

- ***Conservation Forests*** *are forests classified for the purposes of conserving nature, preserving, and propagating plant species, aquatic animals and wildlife species, protecting forest*

ecosystems and others of natural, historical, cultural, touristic, environmental and educational value and for scientific research experiments. Conservation Forests are rich in biodiversity, have unique natural scenery, are of outstanding importance at national, regional, and global levels and may be proposed as wildlife conservation areas, national parks, regional or world heritage sites.

- ***Production Forests*** *are forests including natural forests and planted forests designed for the supply of wood and NTFPs as commodities to fulfil the requirements of natural socio-economic development and people's livelihood.*

3.1.5. Decree #84 on Compensation and Resettlement of People Affected by Development Projects (2016)

Decree on Compensation and Resettlement of People Affected by Development Projects No.84/gov, dated April 5, 2016. This Decree provides principles, regulations and standards on the management, monitoring of compensation of losses and the management of resettlement activities in order to properly and effectively implement development projects with the aims to ensure that the affected people are compensated, resettled and are assisted with permanent livelihood alternatives leading to improving of living conditions to be better off or to be at the same level as they were before as well as to ensure that the projects can contribute to the socio-economic development of the nation in sustainable manners.

This decree requires that to protect the rights, legitimate benefits, and compensation the affected households, consultations will be held between the project owner, state agencies and people who are directly affected by project activities. Appropriate approaches based on prices applied by the state for land, constructed facilities, crop products will be applied for compensation.

3.1.6. Technical Guidelines on Compensation and Resettlement of People Affected By Development Project (2005)

Pursuant to Prime Ministerial Decree No. 192/PM, GoL endorsed the Technical Guidelines on Compensation and Resettlement of People Affected by Development Projects, first issued in November 2005. These guidelines adopted under the Decree 192 are currently under review and revision to be in line with the new Decree 84 and expected to be approved in June 2018. In the meantime, the guidelines prepared under the Decree 192 remain applicable. If there are discrepancies and gaps identified between the GoL legislation and the EIBs Standard 6 – Involuntary Resettlement. the latter will prevail. This legislation provides procedure for the assessment, planning, and mitigation of environmental as well as social impacts from development projects.

These guidelines include detailed procedures for the conduct of public consultation and other participatory processes, to inform affected people of the environmental and social impacts, and to assure their involvement in all aspects of the mitigation and compensation process, from planning to implementation.

3.1.7. Decree on the Preservation of Cultural, Historical and Natural Heritage (1997)

This decree outlines the regulations and measures for the management, conservation, and use of the national heritage, including for upgrading of movable and immovable assets with historical or cultural or natural value into national heritage with the view of raising the spirit of patriotism, people's democracy, awareness, and ownership of the fine national and ethnic cultures.

This decree requires that to prevent exploitation of relics and antiquities, any person who discovers archaeological relics or a cultural site must inform the provincial and district offices within three days.

3.1.8. Decree on Occupational Safety and Health (2019)

This decree sets out the principles, regulations and measures on occupational safety and health to prevent occupational accidents and occupational diseases, create a good environment, and do not pose a health risk, promote valuable, fair, and productive work, aim to protect the rights and interests of workers and employers, improve the lives of workers, integrate regionally and internationally, contribute to the promotion of investment and socio-economic development of the nation.

It is defined that occupational safety and health is a joint activity between employers and workers to ensure occupational safety and health in the workplace, which includes risk assessment of the working environment, appropriate measures to reduce hazards and risks, how to prevent labor accidents, prevent injuries and prevent occupational diseases and create a culture of safety in the workplace step by step.

3.2. Key Standards

3.2.1. Air Quality

National Air Quality Standards

Table 4 tabulates the Lao PDR ambient air quality standards.

Table 4: National Ambient Air Quality Standards [1]

Parameter	Symbol	1 hour	8hour	24 hour	1 month	1 year	Unit
Carbon Monoxide	CO	31	11.1	-	-	-	mg/m^3
		30	9	-	-	-	ppm
Nitrogen Dioxide	NO_2	0.223	-	-	-	0.0405	mg/m^3
		0.11	-	-	-	0.02	ppm
Sulphur Dioxide	SO_2	0.367	-	0.141	-	0.10	mg/m^3
		0.13	-	0.05	-	-	ppm

[1] Decree on National Environment Standard dated 81/GV, dated 21 Feb. 2017

Parameter	Symbol	1 hour	8hour	24 hour	1 month	1 year	Unit
Total Suspended Particulate	TSP	-	-	0.33	-	0.10	mg/m^3
Particulate Matter less than 10 microns	PM-10	-	-	0.12	-	0.05	mg/m^3
Particulate Matter less than 2.5 microns	PM-2.5	-	-	0.05	-	0.015	mg/m^3
Ozone	0_3	0.20	0.14	-	-	-	mg/m^3
Lead	Pb	-	-	-	-	0.00015	mg/m^3

Source: General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017

WBG & EU Standards

WBG EHS Guidelines, which are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), follows WHO Air Ambient Air Quality Guideline. The following table illustrates the guidelines.

Table 5: WHO Ambient Air Quality Guidelines [2]

Parameter	Averaging Period	Guideline Value	
		($\mu g/m^3$)	(mg/m^3)
Sulphur Dioxide (SO_2)	10 minute	500	0.5
	24 Hour	20	0.02
Nitrogen Dioxide (NO_2)	1 Hour	200	0.2
	1 Year	40	0.04
Particulate Matter PM_{10}	24 Hour	50	0.05
	1 Year	20	0.02
Particulate Matter $PM_{2.5}$	24 Hour	25	0.025
	1 Year	10	0.01

[2] Not including interim targets.

Table 6: EU Ambient Air Quality Guidelines

Pollutant	Averaging Period	Objective	Concentration	Comment
$PM_{2.5}$	Annual	Limit value	25 µg/m^3	
PM_{10}	24 hours	Limit value	50 µg/m^3	Not to be exceeded more than 35 days per year
PM_{10}	Annual	Limit value	40 µg/m^3	
NO_2	Hourly	Limit value	200 µg/m^3	Not to be exceeded more than 18 hours per year
NO_2	Annual	Limit value	40 µg/m^3	
SO_2	Hourly	Limit value	350 µg/m^3	Not to be exceeded more than 24 hours per year
SO_2	24 hours	Limit value	125 µg/m^3	Not to be exceeded more than 3 days per year
CO	Maximum daily 8 hour mean	Limit value	10 mg/m^3	

Project Air Quality Standards

WBG General EHS Guidelines (Air Emissions and Ambient Air Quality, 2007) note that project emissions should not result in exceedances of "relevant ambient quality guidelines and standards by applying **national legislated standards**, or in their absence, the current WHO Air Quality Guidelines". As indicated above, Lao PDR has national legislated standards and as such these will be applied to the project.

3.2.2. Noise

WBG Standards

According to the WBG General EHS Guidelines (Noise Management, 2007), noise impacts should not exceed the levels presented in Table 7, or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

Table 7: WBG Noise Level Guidelines, One Hour LAeq (dBA)

Receptor	Daytime (07.00 – 22.00)	Night-time (22.00 – 07.00)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

National Noise Standards

Table 8 provides the national noise standards for Lao PDR. It can be noted that nighttime noise limits are particularly stringent with regards to sensitive receptors such as hospitals and schools.

Table 8: Noise Standards for Other Places (LAeq 24-hrs)

Area	dB(A): 06.00 – 18.00	dB(A): 1 8.00 – 22.00	dB(A): 22.00 – 06.00
Hospitals, libraries, kindergarten, schools	50	45	40
Residential areas	55	55	45
Commercial areas	70	70	50

Project Noise Standards

National standards are more stringent than IFC standards and will be used for the Project.

3.2.3. Vibration

International Standards

The German Standard DIN 4150-3 – Vibration in Buildings – Part 3: Effects on structures provides short term and long-term limits [3] for vibration at the foundation for various structures. This standard is considered international best practice for construction vibration.

[3] short-term vibrations are defined as those that do not occur often enough to cause structural fatigue and do not produce resonance in the structure being evaluated and long-term vibrations are all the other types of vibration.

Table 9: Guideline Values for Vibration Velocity to be Used When Evaluating the Effects of Short-term and Long-term Vibration on Structures

Group	Structure	Guideline Value for Velocity (mm/s)				
		Short-term				Long-term
		At Foundation			Uppermost Floor	Uppermost Floor
		Less than 10 Hz	10 Hz to 50 Hz	50 to 100 Hz	All frequencies	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	10
2	Residential dwellings and buildings of similar design and/or use	5 (105 dB)	5 to 15	15 to 20	15	5 (105 dB)
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g., buildings that are under a preservation order)	3 (100.5 dB)	2 to 8	8 to 10	8	2.5 (99.0 dB)

Source: DIN 4150-3, Structural Vibration, Part 3: Effect of vibration on structures

DIN 4150-3 notes that "experience has shown that if these values are complied with, damage that reduces the serviceability of the building will not occur. If damage nevertheless occurs, it is to be assumed that other causes are responsible. Exceeding the value in the table does not necessarily lead to damage".

Regarding vibration from construction traffic, the maximum permissible limit of traffic vibration, Article 12 of Ministerial ordinance for the regulatory of vibration Japan, 1976 is considered to represent good international practice with a guideline limit of 65dB set for roadside residents in terms of vibration nuisance.

Project Vibration Standards

German Standard DIN 4150-3 will be followed during the construction phase relating to vibration from work sites. Japanese standards will be followed for construction traffic vibration of-site.

3.2.4. Water Quality

WBG Environmental, Health, and Safety General Guidelines (WBG EHS Guidelines)

The WBG provides guidelines values for treated sanitary sewage discharges. The following table provides these values with which the Project shall also comply, for example relating to any wastewater discharge from construction camps.

Table 10: WBG Indicative Values for Treated Sanitary Sewage Discharges

Pollutant	Unit	Guideline Value
pH	pH	6-9
Biological Oxygen Demand (BOD)	Mg/l	30
Chemical Oxygen Demand (COD)	Mg/l	125
Total Nitrogen	Mg/l	10
Total Phosphorus	Mg/l	2
Oil and Grease	Mg/l	10
Total Suspended Solids	Mg/l	50
Total Coliform Bacteria	MPN[A] / 100 ml	400

Table 11: National Wastewater Effluent (General Industrial Wastewater Discharge)[4]

Parameter	Symbol	Standard Value	Unit	Analysis Method
Potential of Hydrogen	pH	6-8.5	No defined	pH Meter
Total Dissolved Solid	TDS	<2,500 mg/l depending on industrial activities and water body, but <5,000 mg/l	mg/L	Dry evaporation at temperature 103-105^{O}C, 1 hour
Total Suspended	TSS	<50 mg/l depending on industrial activities and water body, but <150 mg/l	mg/L	Glass Fiber Filter Disc
Temperature	t	<40	^{O}C	Temperature Meter
Color and Odor	No defined	No	No defined	General
Hydrogen Sulfide	H_2S	<1.0	mg/L	Titration
Cyanide	CN^-	<0.2	mg/L	Distillation and Pyridine Barbituric Acid
Fat, Oil and Grease	FOG	<5.0 mg/l depending on industrial activities and water body, but <15.0 mg/l	mg/L	Solvent Extraction by Weight
Formaldehyde	CH_2O	<1.0	mg/L	Spectrophotometry

[4] Decree on National Environment Standard dated 81/GV, dated 21 Feb. 2017

Parameter	Symbol	Standard Value	Unit	Analysis Method
Phenol	C_6H_5OH	<1.0	mg/L	Distillation and Aminoantipyrine Method 4
Chlorine	Cl^-	<1.0	mg/L	Lodometric Method
Pesticide	-	No	mg/L	GC
Biological Oxygen Demand 5 Days	BOD_5	<30 mg/l depending on industrial activities and water body, but <60 mg/l	mg/L	Azide Modification at 20^OC, 5days
Total Nitrogen	TKN	<100 mg/l depending on industrial activities and water body, but <200 mg/l	mg/L	Kjeldahl
Chemical Oxygen Demand	COD	<120 mg/l depending on industrial activities and water body, but <400 mg/l	mg/L	Potassium Dichromate Digestion; Open Reflux or Closed Reflux
(Heavy metals)				
Zinc	Zn	<5.0	mg/L	AA/AES; ICP
Chromium Hexavalent	Cr^{+6}	<0.25	mg/L	AA/AES; ICP
Chromium Trivalent	Cr^{+3}	<0.75	mg/L	AA/AES; ICP
Copper	Cu	<2.0	mg/L	AA/AES; ICP
Cadmium	Cd	<0.03	mg/L	AA/AES; ICP
Barium	Ba	<1.0	mg/L	AA/AES; ICP
Lead	Pb	<0.2	mg/L	AA/AES; ICP
Nickel	Ni	<1.0	mg/L	AA/AES; ICP
Manganese	Mn	<5.0	mg/L	AA/AES; ICP
Arsenic	As	<0.25	mg/L	AA-Hydride Generation or ICP
Selenium	Se	<0.02	mg/L	AA-Hydride Generation or ICP
Mercury	Hg	<0.005	mg/L	AA-Cold Vapour Technique

Project Water Quality Standards

The Project will follow national standards for water quality and wastewater effluent.

3.3. Permits

The following table indicates the permits that are required for various scales of Projects in Lao PDR.

Table 12: Permit Requirements

#	Description	Scale	Permitting Authority
1	Water extraction	Small project	Natural Resources and Environment Office, District
		Medium project	Department of Natural Resources and Environment, Province
		Large project	Ministry of Natural Resources and Environment
2	Borrow Pit	Small project	Energy and Mines Office, District
		Medium project	Department of Energy and Mines, Province
		Large project	Ministry of Energy and Mines
3	Removal of Trees	Development Project	Village authority & Agriculture and Forest Office

Note: The Contractor will be responsible for determining which of the relevant authorities he will obtain the permits from depending upon the volumes of water and borrow material required under the project.

3.4. EIB Environmental and Social Standards

The EIB is a public entity that is guided by the European Union's policy goals and principles of sustainable development, public engagement, and accountability. It aims to promote sustainable and inclusive growth while safeguarding the natural and social environment in a comprehensive manner, ensuring that environmental and human well-being requirements are included in the definition, preparation, and implementation of all EIB-financed activities.

The EIB also recognizes the need for a proactive approach to guarantee that environmental and social factors are considered early in the strategic decision-making process by promoters to have a real impact on the development options available. To that end, the EIB encourages the use of the strategic environmental assessment as a tool for identifying and analyzing prospective plans and program impacts.

The EIB environmental and social elements that must be evaluated (version February 2022) include:

- Environmental and social impacts and risks
- Stakeholder engagement

- Resource efficiency and pollution prevention
- Biodiversity and ecosystems
- Climate change
- Involuntary resettlement
- Vulnerable groups, indigenous peoples, and gender
- Labor rights
- Health, safety, and security
- Cultural heritage

3.5. WBG General EHS Guidelines

In addition to the above, the WBG General EHS guidelines also provide extensive guidance on a range of other EHS issues, such as occupational health and safety, community health and safety, etc. The mitigation measures that have been adopted for this Project have included all the relevant WBG EHS guidelines, including:

- Air Emissions and Ambient Air Quality
- Wastewater and Ambient Water Quality
- Hazardous Materials Management
- Waste Management
- Noise
- Contaminated Land
- Community Health and Safety
- Occupational Health and Safety

3.6. World Bank ESF

The Project will also ensure compliance with the requirements of the WB ESF and their Environmental and Social Standards, including:

ESS1: Assessment and Management of Environmental and Social Risks and Impacts sets out responsibilities to assess, manage and monitor environmental and social risks and impacts associated with each phase of the project, supported by the World Bank with Investment Project Financing (IPF).

ESS2: Labor and Working Conditions, describes the importance of creating employment and income for comprehensive financial development and poverty reduction.

ESS3: Resource Efficiency and Pollution Prevention and Management, refers to resource efficiency and pollution prevention and pollution management requirements with a holistic approach in project implementation.

ESS4: Community Health and Safety, emphasizes health, safety and security risks and their impact on communities due to project activities.

ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement requires avoiding compulsory resettlement, if not avoided, necessary measures should be taken to reduce negative effects on displaced people.

ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources requires conservation and preservation of natural resources living with biodiversity is essential in ensuring sustainable development.

ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities encourages the development process of these communities to respect the human rights, identity, culture and lifestyles based on natural resources.

ESS8: Cultural Heritage states that cultural heritage provides continuity in concrete and abstract forms between past, present and future. Necessary measures should be taken to protect cultural heritage in the implementation of the projects.

ESS10: Stakeholder Engagement and Information Disclosure emphasizes the importance of open and transparent participation between the client and stakeholders, and good international practice is an essential element. It contributes to projects in terms of effective stakeholder engagement, improving environmental and social sustainability, increasing project acceptance and successful project design.

3.7. EIB Environmental and Social Standards and World Bank environmental and social standards (ESS) Applicable to the Project & Gap Analysis with National Regulations

3.7.1. *General*

This section sets out in tabular format the relevant WB ESS and EIB Standards and any gaps between them and national regulations. As noted above, an IEE completed to national standards, as well as a lenders compliant ESIA have been prepared to ensure that all relevant regulatory and lender requirements are included in the Project.

Table 13: Gap Analysis

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
ESS1: Assessment And Management Of Environmental and Social Risks and Impacts Standard 1 – Environmental and Social Impacts and Risks	• Conduct an environmental and social assessment of the proposed project, including stakeholder engagement. • Undertake stakeholder engagement and disclose appropriate information in accordance with ESS10 / Standard 2. • Develop an ESCP, and implement all measures and actions set out in the legal agreement including the ESCP. • Conduct monitoring and reporting on the environmental and social performance of the project against the ESSs / EIB Standards. • Preparation of an ESMP	• A broad guidance for E&S assessment is articulated in the Environmental Protection Law (2012), Article 21 (for IEE), and Article 22 (for EIA). • Further guidance for the conduct of ESIA and ESMP is provided in the Decree on Environmental Impact • Assessment (2019), and the Decision on EIA process (2013). • The Decision on the Endorsement and Promulgation on the List of Investment Projects and Activities (No.8056/MONRE, 2013) indicates that improvement or rehabilitation of existing national or provincial roads required only the conduct of IEE. However, the final clause	• The Lao PDR's regulation requires the conduct of IEE for national road improvement, not ESIA and less focus on social issues • No capacity of the project owner to implement and monitor the ESMP is required. • There is no provision for the "no project" option. • No reference to institutional capacity development and training measures. • No separate ESCP, SEP and/or EGEP is required by the Lao laws.	• The ESIA in-hand ensures that all key differences are addressed, including no project option and capacity building and training measures. • Separate SEP & EGEP prepared. • Project includes requirements to follow ESOM where relevant. • ESMP in hand provides measures to ensure implementation of the ESMP.

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
		of this Decision asserts that any projects that cause involuntary resettlement shall require the conduct of ESIA. • Environmental and Social Operations Manual for Road Sector (2009) also provides additional E&S requirements for road sector projects.		
1. ESS2: Labour and Working Conditions 2. Standard 9: Health Safety and Security 3. Standard 8: Labour Rights	4. ESS2, Standard 8 and 9 establishes minimum requirements in the following areas to be observed: • Terms and Conditions of Employment • Non-Discrimination and Equal Opportunity • Rights to Organize. • Prevention / restriction of child Labour • Prevention of forced Labour	• The employee rights and working conditions are specified in the Labour Protection • Law (2013) which has provisions that are consistent with the Bank's ESS2; • In addition, the Prime Minster's Notification on the Minimum Wage of Labour in Lao PDR (2018) also sets out a minimum wage of LAK 1.1 million/month.	• In Lao PDR, the Trade Union is managed under the government system which are not a collective association of workers. However, the WB's ESS2 outlines that the project will not restrict project workers from developing alternative mechanisms to express their grievances and protect their legitimate rights regarding working conditions and terms of employment. The Borrower should not seek to influence or control discriminate to retaliate against project workers	• The national Labour Law is highly consistent with ESS2 and Standard 8. However, to address some of the gaps, the project's LMP includes: • Procedure to Prevent Child Labour and Forced Labour (PPCLFL). • Project Workers' Grievance Mechanism. • In addition, the LMP sets out requirements for additional measures to comply with ESS2 and Standard 8, which will include:

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
	• Grievance Mechanism for Labourers • Identification of potential hazards • Provision of preventive and protective measures • Training of workers and maintenance of training records • Documentation and reporting of occupational accidents, disease, and incidents. • Emergency Preparedness; and • Remedies for adverse impacts on workers safety, • including occupational health, and safety and SEA/SH. • Zero tolerance for the use of forced labour4 and child labour5;	• The Law on Grievance Redress (2016) also outlines conflict resolution procedures.	who participate, or seek to participate, in workers' organization and collective bargaining or alternative mechanisms. • There is no specific national guidelines for labour conflict resolution.	○ Direct Project Workers' Occupational Health and Safety Strategy ○ Terms and Conditions of Employment for Direct Project Workers. ○ Environmental, Social, Health and Safety Specification (ESHSS) for contracts. ○ Community Labour Management Procedure. ○ Provisions in location and site - specific ESMP ○ Site-specific Occupational Health and Safety Plans (works) ○ The project will only allow employment of people 18 years old and above.

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
	• Respecting the principles of freedom of association and collective bargaining;			
5. ESS3: 6. Resource Efficiency and Pollution Prevention and Management Standard 3: Resource Efficiency and Pollution Prevention	7. Resource Efficiency and Pollution Prevention requires project to: • Promote more sustainable use of resources including energy and water and the reduction of project related GHG emissions; and • Avoid or minimize pollution from project activities. • Ensuring consistency with the "Do Not Significant Harm" principle and thus contributing to the achievement of the "zero pollution"	• Key legislation regarding resource efficiency and pollution prevention include the Decree on Lao PDR National Environmental Standards (2017); Ministerial Instructions on Hazardous Waste Management (2015); and the Law on Environmental Protection (2012); Decision on Pollution Control (2021), Decree on Energy Saving and Efficiency (2020), National • Policy on Energy Efficiency (2016), Law on Water and Water Resources (2017).	• There is a lack of national policy for enhancing the resource efficiency of infrastructure particularly the use of construction materials e.g. sand, gravel.	• ESS3 and Standard 3 will be implemented to apply a precautionary approach that complements the national regulation that ensures the rational and sustainable resource uses, manage, and prevent the pollution. • Standard Waste Management Plan will be required from the Contractor. • Measures to manage extraction activities are included in the ESMP and ESIA
8. ESS4: 9. Community Health and	10. The Bank's Standards requires for Community Health, Safety and Security	• Key legislation for community health, safety, and security in Lao PDR include the	• Currently, there is no national law, regulation or guideline specific to community health and	• The ESIA and ESMP provide specific measures to manage CHS based on GIIP.

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
Safety Standard 9: Health Safety and Security	and requires projects to: • Avoid or minimize adverse impacts on the health and safety of project affected communities; and • Ensure safeguarding project property and personnel is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to project affected communities. • Identify, assess and manage risks to the health and safety of project-affected people and communities, (including to project-related gender-based violence risks including sexual harassment, exploitation and abuse) during the life-cycle of the project.	Decree on Occupational Health and Safety (2019), Law on Road Traffic (2012), Lao PDR National UXO / Mine Action Standards (2012); and discharge / hazardous waste legislation.	safety.	
11. ESS5: Land Acquisition, Restrictions on Land Use And Involuntary Resettlement	• Avoid or at least minimize involuntary resettlement wherever feasible by exploring alternative project designs and layouts;	• Key national legislation related to land acquisition and involuntary resettlement includes the Law on Land (2019); Forestry	• According to the Land Law (2019), Article 130: Acquisition of Customary Land Use Rights, rights can only be assigned to individuals that can	• A resettlement action Plan has been prepared to meet the requirements of ESS5 / Standard 6.

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
Standard 6: Involuntary Resettlement	• Mitigate adverse social and economic impacts from land by: (i) Providing compensation for loss of assets at replacement cost; and (ii) Ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation and the informed participation of those affected; • Improve or at least restore the livelihoods and standards of living of displaced persons; and • Improve living conditions among displaced persons through provision of adequate housing with security of tenure at resettlement sites.	Law (2019), Law on Resettlement and Vocation (2018); and the Decree on Compensation and Resettlement (2016).	demonstrate continual use of the land for more than 20 years. • However, the World Bank's ESS5 articulates that those who suffer negative social and economic impacts as a result of the acquisition of land for a project and / or restrictions on land use, may include those having legally recognized rights or claims to the land; those with customary claims to land; and those with no legally recognized claims.	
12. ESS6: 13. Biodiversity Conservation and Sustainable Management	• The E&S assessment will consider direct, indirect and cumulative project-related impacts on habitats and the biodiversity they support.	• EIA process provides for analysis of all potential alternatives. There is no explicit rule providing for use of land already converted and to avoid	• Lack of clear reference to siting project on lands already converted. • In the hypothesis that no feasible alternative exists	• Project activities will be confined almost exclusively to the existing alignment and Right of Way and will not include construction on lands already converted.

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
of Living Natural Resources Standard 4 – Biodiversity and Ecosystems	• The Borrower will avoid adverse impacts on biodiversity and habitats. • Where the project occurs within or has the potential to adversely affect an area that is legally protected, designated for protection, the Borrower will ensure that any activities undertaken are consistent with the area's legal protection status and management objectives.	land located within protected area, water catchment and area containing high forest. • However, since 2016 with WB supports (through the Environment Protection Fund), MoNRE and MAF capacity as well as the PONREs and PAFOs of Oudomxay province to protect and manage Phou Hinphee NPA and protection forest area including enforcement of wildlife trade has been strengthened.	as demonstrated by an ESIA, there is no legal obligation to provide for compensation for conversion of non- critical habitats. • There is no mention of "critical natural habitats" or prohibition on investing in projects that would degrade or convert them.	• Measures and process to avoid and/or mitigate impacts on natural habitats has been included in the ESIA.
14. ESS7: 15. Indigenous People/Sub-Saharan African Historically Underserved Traditional Local Community Standard 7:	• Requires the Borrower to avoid adverse impacts on communities of indigenous peoples and to engage with affected communities to ensure they have given their Free Prior and Informed Consent.	• The Decree on Ethnicity (2020) confirms that the GOL has special policies for ethnic, vulnerable and disadvantaged groups. • The National Social Protection Strategy (2020) states that ethnic groups, women, children, vulnerable people and those living in remote	• The Land Law does not specifically mention customary to land used by ethnic and vulnerable groups who are often found to be present and have collective attachment to the forestlands in rural area in Laos. There is no sub-law registration with implementable procedures in place for registering communal and non-	• An EGEP has been prepared as a stand-alone document to cover the existing gaps. The EGEP provides proactive and inclusive approach and measures to ensure the vulnerable and ethnic groups will not be negatively affected by the project activities. 16.

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
Vulnerable Groups, Indigenous Peoples and Gender		areas are specially promoted to access education, health care and equal economic activities.	communal (individual) customary rights. This may negatively impact ethnic groups and other vulnerable communities, since excluding such communities from the benefits of land registration and overruling or replacing their actual customary land (e.g. with smaller area or poorer quality of land) could increase inequality and their vulnerability. There are no specific	
17. ESS8: 18. Cultural Heritage Standard 10: Cultural Heritage	• Aims to protect cultural heritage through consultation procedures, community access and removal of replicable cultural heritage. Provides specific requirements for chance finds, consultation, community access, removal of replicable and non-replicable cultural heritage, as well as critical cultural heritage.	• Key applicable national legislation includes the Law on National Heritage (2013), Agreement of the National Assembly on Ethnicity (2008) and the Decree of the President of Lao PDR on the Preservation of Cultural, Historical and Natural Heritage (1997). • Mandatory reporting to authorities (Ministry of Culture and Information	• No significant gap. Reference to "chance finds" is formally lacking in applicable laws and regulations.	• The ESIA and ESMP includes requirements for a chance find procedure.

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
		and MPWT). The project owner and contractor must interrupt all construction activities and measures must be adopted to preserve the vestiges uncovered by chance until the classification of those assets or until conclusion of the • Archaeological research shall be prescribed by the Ministry of Culture and Information. The area of archaeological patrimony accidentally revealed must be delimited, as suitable and protected under the responsibility of the project owner and contractor.		
19. ESS10: 20. Stakeholder Engagement and Information Disclosure Standard 2:	• Requires effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them. • Provides specific	• GOL's requirements are covered by various legislations, especially those on consultation and grievance including the Constitution, the Law on Government (amended 2016), the Law on Handling Petitions	• There is a lack of clarity about when engagement activities can be considered meaningful. Those affected by a project can file grievances using the existing system, not a project-based system. There are also unclear	• This ESIA summarizes the SEP in terms of consultations and disclosure. A SEP consistent with ESS10 and Standard 2 has been prepared for this project. • A SEP has been developed

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
Stakeholder Engagement 21.	requirements for Stakeholder Analysis and Engagement Planning, Disclosure of Information, Consultation and Indigenous Peoples. • Establishment of a Grievance mechanism	(amended 2016), as well a sub- ordinate decrees such as the EIA Decree • (2019) and the Compensation and Resettlement Decree (2016), as well as the Public Involvement Guideline (2012) and the Ethnic Group Consultation Guideline (2013)	procedures on public disclosure of E&S documents, and on how to respond to concerns and grievances of project-affected parties • The ethnic group consultation guideline (2013) is the sole document requiring consultation with ethnic groups. The EIA decree only requires dissemination of information to them.	which details a GRM for the project covering all project aspects, including concerns about environmental and social impacts. • The GRM must be accessible to all stakeholders, in particular vulnerable, ethnic group people, and women and suitable receive and respond to SEA/SH.
22. Standard 5: Climate Change	• Assessing GHG emissions at the project level. • Assessing the project's resilience to physical climate risks	• The decree on climate change (2019) encourages relevant authorities to adapt to climate change adaptation practices. Adaptation to climate change is an adapting of people, animals, plants, ecosystems, infrastructure, urban planning, etc. to be tolerant of climate change and to have the least impact by applying appropriate measures in	• No specific requirement for projects to report emissions.	• Climate Change Adaptation Report prepared for the project and summarized in the ESIA with mitigation measures presented in the ESIA. • GHG emissions assessed as part of the ESIA.

ESS / Standard	ESS / Standard Requirements	Lao E&S Regulations	Key Difference	How Gap is Addressed
		reducing fragility, risks and potential damages.		

4. IMPLEMENTATION

The main institutions that will be involved in implementation of the ESMP are the Concept Design Consultant, the Implementation Support and Works Supervision Consultant (ISWS, or "the Engineer"), the Contractor(s) and the MPWT through the Environment research and Disaster Prevention Division of the Public Works and Transport Institute (EDPD/PTI).

4.1. Concept Design Consultants (CDC) Responsibilities

The CDC will ensure that he reads and understands all the identified environmental impacts highlighted by this ESIA. He will also ensure that all recommendations made for the design phase of the ESMP are considered and incorporated in the concept designs, or that justifications are made for the exclusion of any recommended mitigation measure.

4.2. ISWS (Engineer) Responsibilities

The Engineer is tasked with specific responsibility to ensure safeguard compliance of civil works – with particular emphasis on the monitoring of implementation of ESMP through the Contractors Construction Environment and Social Management Plan (CESMP) and related aspects of the project. The Engineer will ensure the Contractor's ESHS performance is in accordance with good international industry practice and delivers the Contractor's ESHS obligations.

To achieve this, the Engineer will include a part-time International Environmental and Social Specialist (IESS) (for 3 months for each year of construction) and a full time National Environmental and Social Specialist (NESS) and a full time National Occupational Health and Safety Specialist (NOHSS) to monitor implementation of the ESMP during construction of all Project Components. In addition, an International Team Leader of the Implementation support and supervision consultant will take overall responsibility in ensuring that the Project is implemented consistent with the provisions of the ESMP. The main responsibility of the Engineer includes, but is not limited to:

- review and approve the Contractor's CESMP, including all updates and revisions (not less than once every 6 monthly);
- review and approve ESHS provisions of method statements plans, proposals, schedules and all relevant Contractor's documents;
- review ESHS risks and impacts of any design change proposals and the implications for compliance with ESIA, ESMP, consent/permits and other relevant project requirements;
- undertake audits, supervisions and/or inspections of any sites where the Contractor is undertaking activities related to the Works, to verify the Contractor's compliance with ESHS requirements, with and without contractor and/or client relevant representatives, as necessary, but not less than once per month. NESS to monitor the Contractor's implementation of his CESMP via weekly inspections of the Contractors camps and work sites;
- undertake audits and inspections of Contractor's accident logs, community liaison records, monitoring findings and other ESHS related documentation, as necessary, to confirm the Contractor's compliance with ESHS requirements;

- agree remedial action/s and their timeframe for implementation in the event of a noncompliance with the Contractor's ESHS obligations;
- attend meetings including site meetings, progress meetings to discuss and agree appropriate actions to ensure compliance with ESHS obligations;
- check that the Contractor's actual reporting (content and timeliness) is in accordance with the Contractor's contractual obligations;
- review and critique, in a timely manner, the Contractor's ESHS documentation (including regular reports and incident reports) submitted to the Engineer and to provide advice to ensure the accuracy and efficacy of the documentation
- undertake liaison, from time to time and as necessary, with project stakeholders to identify and discuss any actual or potential ESHS issues;
- prepare a brief monthly and quarterly report that describes the work that the Engineer's IESS, NESS and NOSHS have undertaken, the issues (including any Contractor's ESHS noncompliance, details of the Contractors activities (such as training programs, community meetings, etc.) and compliance with the ESMP and CESMP)) identified and the actions taken to address the issues;
- conduct a due diligence of the borrow pits proposed for use by contractor to ensure that the borrow pits meet requirements set out in this ESMP;
- help the Contractor with the development of the Contractors CESMPs (at least three months prior to the start of construction);
- engage external service from a certified laboratory for environmental instrumental monitoring of air quality, noise and water quality;
- assess the RAP implementation and prepare the RAP completion report with recommendations if the project site/road section or parts of it can be handed over to the contractor; and
- Report accidents to the PMU.

If the Engineer identifies any ESMP / CESMP non-compliance issues by the Contractor, a Non-Compliance Notice will be issued to the contractor if the Engineer requires action to be taken. The Contractor will be required to prepare a corrective action plan which is to be implemented by a date agreed with the Engineer. Non-compliance will be ranked according to the following criteria:

- Non-Compliance Level l: A situation that is not consistent with requirements of the ESMP/CESMP, but not believed to represent an immediate or severe social or environmental risk. Repeated Level I concerns may become Level II concerns if left unattended.
- Non-Compliance Level II: A situation that has not yet resulted in clearly identified damage or irreversible impact, but which demonstrates potential significance. Level II requires expeditious corrective action and site-specific attention to prevent severe effects. Repeated Level II concerns may become Level III concerns if left unattended.
- Non-Compliance Level III: A critical situation that will result in significant social or environmental damage occurring or a reasonable expectation of very severe impending damage. Intentional disregard of Non-Compliance Notices or specific prohibitions is also classified as a Level III concern.

The failure to prepare a corrective action plan or to implement it within the required timeframe will result in the Employer undertaking the work at the Contractor's expense (as will be specified in the Contract).

A Terms of Reference for the Engineers IESS and NESS is provided below.

National Environmental and Social Specialist (NESS)

Scope of Services: He/she will (i) review all documents and reports regarding the integration of environmental and social including contractor's environmental and social action plan, (ii) supervise the contractors' compliance to ESMP / CESMP and BMP, (iii) conduct a due diligence of the borrow pits proposed for use by contractor to ensure that the borrow pits meet requirements set out in this ESMP, and (iii) prepare monthly compliance reports.

Qualification: Degree in environmental sciences or equivalent. Preferably five (5) years' experience in conducting environmental and social impact assessments and implementation of environment and social mitigation plans and/or monitoring implementation of environmental and social mitigation measures during implementation of projects including highway projects funded by developing partners. Experience of monitoring biodiversity mitigation and management plans is essential.

Time Period: The NESS will be a full-time position over the duration of the construction period.

International/Regional Environmental and Social Specialist (IESS)

Scope of Services: During the supervision stage the IESS will prepare a detailed action plan including environmental and social monitoring checklists to be completed by the NESS to ensure that the Environmental and Social Management System is established, implemented, maintained and will monitor its performance. He/she will also take care of all environmental and social issues during construction works. He/she will also conduct environmental and social training and briefings to provide environmental awareness on EIB and the government's environmental safeguards policies, requirements and standard operating procedures in conformity with the government's regulations and international practice; ensure baseline monitoring and reporting of Contractor's compliance with contractual environmental and social mitigation measures during the supervision stage. The IESS will review and advise the relevant person (of the Engineer) on the ESHS risks and impacts of any design change proposals and the implications for compliance with ESIA, ESMP, consent/permits and other relevant project requirements. The IESS will also help the with the development of the Contractors CESMPs (at least three months prior to the start of construction). The IESS will prepare Quarterly Environmental Reports providing details of the Contractors activities (such as training programs, community meetings, etc.) and compliance with the ESMP and CESMP. The IESS will conduct a due diligence of the borrow pits proposed for use by contractor/provide advice to the NESS and NOHSS in conducting the due diligence to ensure that the borrow pits meet requirements set out in this ESMP. The IESS will also be responsible for monitoring implementation of the BMP.

Qualification: Degree or diploma in environmental sciences or equivalent. Preferably twelve (12) years' experience in conducting environmental and social impact assessments and implementation of environment mitigation plans and/or monitoring implementation of environmental mitigation measures and health and safety plans during implementation of projects including highway projects funded by developing partners, including 8 years' international experience. Working knowledge in Lao Language and experience in Southeast

Asian countries is preferred. Experience of monitoring biodiversity mitigation and management plans is essential.

Time Period: The IESS will be engaged on a part-time basis for a period of 3 months per year).

National Occupational Health and Safety Specialist (NOHSS)

Scope of Services: The NOHSS shall help prepare the Occupational Health and Safety (OHS) Plan which forms part of the Contractors overarching CESMP. The NOHSS will also prepare health and safety monitoring checklists to ensure that the OHS Plan is implemented and maintained throughout the contract period. He/she will also take care of all OHS issues during construction works including conducting OHS training and daily toolbox briefings to provide OHS awareness. The NOHSS will review and advise the relevant person (of the Engineer) on the OHS risks and impacts of any design change proposals and the implications for compliance with ESIA, ESMP, consent/permits and other relevant project requirements. The NOHSS will prepare Quarterly OHS Reports providing a summary of the reporting periods monitoring checklists, incident and accident reports, non-compliance reports, training programs, etc.

Qualification: A relevant, recognized OHS qualification (such as NEBOSH / IOSH / OSHA or another regionally recognized qualification). Preferably five (5) years' experience as an OHS practitioner during implementation of large infrastructure projects including highway projects. Working knowledge of English is required.

Time Period: The NOHSS will be engaged on a full-time basis over the duration of the construction period.

It is also recommended to include a Road Safety Specialist on a part-time basis.

4.3. Contractor Responsibilities

The Contractor will appoint one full-time Environmental and Social Manager (ESM), one full-time Occupational Health and Safety Manager (OHSM) and a part-time Ecological Clerk of Works (ECOW) to be a senior members of the construction management team based on site for the duration of the contract. The Contractor will also include a full-time Community Liaison Officer (CLO).

The ESM will have a university degree (preferably at Master's level) in Environmental Science or related discipline and have at least 10 years work experience in environmental management of infrastructure projects. The OHSM will have a university degree and a recognized health and safety certification and at least 10 years work experience in health and safety issues for infrastructure projects. The ECOW will have at least 5 years experience of managing biodiversity related issues on major infrastructure projects.

Key responsibilities of the Contractor (through the ESM, ECOW, CLO and OHSM) are as follows:

- Completing detailed design including all the environmental and social mitigation measures in this ESIA.
- Preparing the CESMP for approval by the Engineer prior to the Contractors taking possession of the construction site (see below).
- Ensuring the CESMP is implemented effectively throughout the construction period.

- Coordinating community relations issues through acting as the Contractor's community relations focal point (proactive community consultation, complaints investigation and grievance resolution).
- Provide technical guidance on the implementation of the BMP
- Coordinate the pre-construction surveys, biodiversity checks and monitoring in accordance with the BMP, ESMP and ESIA.
- Undertake supervisory tasks including the supervision of the habitat clearance works.
- management of the biodiversity 'permit to work systems' and compliance monitoring and enforcement.
- Establishing and maintaining site records of:
    - Weekly site inspections using checklists based on the CESMP;
    - Environmental and health and safety accidents/incidents including resolution activities (including reporting of accidents to the ISWS Consultant);
    - Non-compliance notifications issued by the Engineer;
    - Corrective action plans issued to the Engineer in response to non-compliance notices;
    - Community relations activities including maintaining complaints register;
    - Preparing monitoring reports (Monthly);
    - Routine reporting of CESMP compliance and community liaison activities;
    - Ad hoc reporting to the Engineer of environmental incidents/spillages including actions taken to resolve issues; and
    - Provide daily toolbox training at the construction camp and also at construction sites. The ESM and OHSM will keep a record of all monthly training and toolbox training undertaken.

4.4. Government Responsibilities

A PMU established within the Department of Roads (DoR) will be responsible for the day-to-day management of the Project components. The Environment research and Disaster Prevention Division of the Public Works and Transport Institute (EDPD/PTI) of MPWT will lead all aspects of ES safeguards preparation, implementation, supervision and reporting. EDPD/PTI is responsible for fulfilling ES safeguards policy requirements as agreed with WB and EIB as well as those to be required by GOL (IEE, and resettlement) applicable to the Project. An Environmental and Social Management Unit (ESMU) has been established within the EDPD/PTI and will be responsible for overseeing and monitoring implementation of the ESMP, RAPs, LMP, SEP, EGEP and gender action plan (GAP). The ESMU will be headed by a manager (Mr souksamay). The ESMU responsibilities in respect of implementation of the ESMP will be as follows:

- Overseeing full compliance with project safeguard instruments and will conduct monitoring of safeguard policy implementation.
- Ensure that all relevant ESMP requirements (including environmental designs and mitigation measures) are duly incorporated into the project bidding documents.

- Review necessary permits and/or clearance, as required, from MONRE / PONRE and other relevant government agencies, ensuring that all necessary regulatory clearances are obtained by the Contractor before commencing any civil work on the project.
- Liaising with the Department of Environment and Social Impact Assessment of the Ministry of Natural Resources and Environment (MONRE).
- Ensure that the Contractor has access to the ESMP and ESIA report.
- Ensure that the Contractor understands his responsibilities to mitigate environmental problems associated with their construction activities and facilitate training of their staff in implementation of the ESMP.
- Approve the CESMP, with support from the engineer, before the Contractor takes possession of construction site.
- Undertake regular site visits to assess the Contractors compliance with the ESMP / CESMP and make recommendations to the Contractor where non-compliance issues are identified.
- Keep proper safeguards documentations.
- Lead safeguard supervision and reporting at the project level. ESMU will prepare six month and annual safeguard progress report.
- Integrating the gender dimension into safeguards documents, and consultation processes;
- Track and report on grievances received, addressed, and overall work and implementation of the grievance redress mechanism (GRM).
- Regular coordination and meetings with the Engineer to discuss Project progress and any issues.

The ESMU Manager, will also be responsible for overall planning and implementation of environmental and social management for the Project, as well facilitating consultation activities, and coordination with local authorities, AHs, NGOs/civil society organizations (CSOs) and other stakeholders. The ESMU will monitor and report on the effectiveness of implementation of the ESMPs and RAPs and coordinate activities during construction and post-construction aimed at improving the environmental and social performance of the Project.

The ESMU will support the PMU to prepare all documentation and reports concerning the environmental and social aspects of the Project including progress reports to be submitted to PMU and DONRE/PONRE during the implementation period.

The team of social and resettlement specialists will undertake their tasks in accordance with TOR and job descriptions and will ensure all plans are updated and complied with. The resettlement specialist will report to the ESMU-Manager.

The ESMU will work closely with the Project Resettlement Committee (RC) to review and address all complaints and grievances arising in the course of implementation of any ESMP and RAP and resolve them as far as it can with the concerned parties. If the complainant is not satisfied, the matter will be resolved through appeal and tracking through the grievance redress procedure.

The ESMU Manager will report directly to PMU and work closely with provincial/district authorities. S/he will also work with and provide with support from the EIB's safeguard specialists. The role of the ESMU Manager will be to ensure that the environmental and

social mitigation and monitoring measures are implemented during the course of Project construction and operation. The ESMU Manager will act on behalf of the PMU in dealing with Government agencies, RC, or other concerned parties, and will be the MPWT/PMU representative on the RC.

The activities of the Manager-ESMU will include, but not necessarily be limited to:

- Maintaining good relations and communication with the local communities affected by or involve in the project;
- Coordination, supervision, monitoring and reporting on activities undertaken in compliance with each ESMP & RAP;
- Liaising between the project manager (PMU), consultants, Government agencies, RC, and contractors/agencies engaged to implement the ESMPs and RAP;
- Supervising and monitoring field activities in relation to ESMP and RAP implementation;
- Supervising specific routine technical tasks of the ESMU and performance of ESMU staff and consultants; and
- Preparing internal progress reports as required and reporting to the head of the PMU.

At the district level, project implementation teams (PIT) will be established to oversee the implementation of the project, including environmental and social safeguards, at the project towns. The responsibilities of the PIT are summarized below:

- Coordinate the implementation of project activities at the district level;
- Ensure the implementation of the approved work plans and program of activities;
- Prepare and submit regular quarterly and annual physical and financial progress reports to the PMU;
- Oversee and coordinate civil works and construction activities;
- Ensure the implementation of social and environmental safeguards and including timely disclosure of safeguards documents;
- Ensure the implementation of the Consultation and Participation Plan, Gender Action Plan, and Ethnic Minorities Plan;
- Ensure implementation of resettlement plans including adequate measures to mitigate adverse resettlement impacts;
- Coordinate implementation of environmental management plan, and submit regular monitoring reports to the PMU;
- Coordinate the updating of the resettlement plans and monitor implementation of resettlement activities; and
- Undertake monitoring of project activities and prepare regular reports to the PMU on project achievements.

4.5. Construction Environmental and Social Management Plan (CESMP)

Following the award of the contract and prior to construction commencing the Contractor will review the ESMP and develop this into his detailed CESMP. The CESMP will identify persons who will be responsible for supervising the work within the Contractor's team. This information will be presented in a series of site plans covering the whole project site showing all environmental management requirements for all activities in the construction phase. The CESMP will also include the following plans:

- Pollution Prevention Plan
- Waste Management and Recycling Plan
- Construction Camp Management Plan
- Borrow Pit Plan (if required)
- Emergency Response Plan
- Air Quality Plan
- Occupational Health and Safety Plan
- Community Health and Safety Plan
- Traffic Management Plan
- Bridge Construction Plan
- Topsoil Management Plan
- Construction Vibration Management Plan
- Spill Response Plan
- Chance Find Procedure
- Method Statement for Removal of Asbestos
- Method Statement for Spoil Disposal

The CESMP will also include a monitoring plan and a reporting program corresponding to the requirements of the ESMP. The CESMP, and all its plans without exception, will be submitted to the Engineer, PMU and EIB for review and will require approval from the Engineer prior to the Contractor taking possession of any work site.

It is recommended that the Engineers' IESS supports the Contractor's ESM through on the job training in the preparation of the CESMP.

4.6. Site Induction

Following approval of the CESMP the Contractor will be required to attend a site induction meeting with the Engineers IESS whereby the CESMP is confirmed with the Contractor to ensure that all compliance conditions are clearly understood. Following confirmation of the CESMP with the Contractor the Engineers IESS advises the Engineers Team Leader that the Contractor is now cleared to take possession of the Site and may commence moving equipment to the Site. The Contractor will be responsible for ensuring that all sub-contractors abide by the conditions of the CESMP.

4.7. Reporting

Contractors Reporting - The Contractor will prepare two levels of environmental reports:

- Weekly Environmental Checklists – These will be prepared weekly by the Contractors ESM and will be submitted to the Engineer on a weekly basis.

- Monthly Summary Report - in respect of compliance with ESMP / CESMP requirements that will be submitted to the PMU through the Engineer. The report will contain sections relating to:

    - environmental incidents or non-compliances with contract requirements, including contamination, pollution or damage to ground or water supplies, temples or cultural heritage site, protected areas, etc.;

    - health and safety incidents, accidents, injuries and all fatalities that require treatment;

    - interactions with regulators: identify agency, dates, subjects, outcomes (report the negative if none);

    - status of all permits and agreements:

        - work permits: number required, number received, actions taken for those not received;

        - status of permits and consents:

            - list areas/facilities with permits required (quarries, asphalt & batch plants), dates of application, dates issued (actions to follow up if not issued), dates submitted to the engineer, status of area (waiting for permits, working, abandoned without reclamation, decommissioning plan being implemented, etc.);

            - list areas with landowner agreements required (borrow and spoil areas, camp sites), dates of agreements, dates submitted to resident engineer (or equivalent);

            - identify major activities undertaken in each area this month and highlights of environmental and social protection (land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation);

    - health and safety supervision:

        - occupational, health and safety officer: number days worked, number of full inspections & partial inspections, reports to construction/project management;

        - number of workers, work hours, metric of PPE use, worker violations observed (by type of violation, PPE or otherwise), warnings given, repeat warnings given, follow-up actions taken (if any);

- worker accommodations:
  - number of expats housed in accommodations, number of locals;
  - date of last inspection, and highlights of inspection including status of accommodations' compliance with national and local law and good practice, including sanitation, space, etc.;
  - actions taken to recommend/require improved conditions, or to improve conditions.
- HIV/AIDS: provider of health services, information and/or training, location of clinic, number of non-safety disease or illness treatments and diagnoses (no names to be provided);
- gender (for expats and locals separately): number of female workers, percentage of workforce, gender issues raised and dealt with (cross-reference grievances or other sections as needed);
- training:
  - number of new workers, number receiving induction training, dates of induction training;
  - number and dates of toolbox talks, number of workers receiving Occupational Health and Safety (OHS), environmental and social training;
  - number and dates of HIV/AIDS sensitization training, no. workers receiving training (this month and in the past); same questions for gender sensitization, flag lady/flagman training.
- environmental and social supervision:
  - Environmental and social person(s): days worked, areas inspected and numbers of inspections of each (road section, work camp, accommodations, quarries, borrow areas, spoil areas, stream crossings, etc.), highlights of activities/findings (including violations of environmental and/or social best practices, actions taken), reports to environmental and/or social specialist/construction/site management; and
  - community liaison person(s): days worked (hours community center open), number of people met, highlights of activities (issues raised, etc.), reports to environmental and/or social specialist /construction/site management.
- Grievances: list current month's and unresolved past grievances by date received, complainant, how received, to whom referred to for action, resolution and date (if completed), data resolution reported to complainant, any required follow-up (Cross-reference other sections as needed):
  - Worker grievances;
  - Community grievances

- Traffic and vehicles/equipment:
  - traffic accidents involving project vehicles & equipment: provide date, location, damage, cause, follow-up;
  - accidents involving non-project vehicles or property (also reported under immediate metrics): provide date, location, damage, cause, follow-up;
  - overall condition of vehicles/equipment (subjective judgment by environmentalist); non-routine repairs and maintenance needed to improve safety and/or environmental performance (to control smoke, etc.).
- Environmental mitigations and issues (what has been done):
  - dust: number of working bowsers, number of waterings/day, number of complaints, warnings given by environmentalist, actions taken to resolve; highlights of quarry dust control (covers, sprays, operational status); % of rock/muram/spoil lorries with covers, actions taken for uncovered vehicles;
  - erosion control: controls implemented by location, status of water crossings, environmentalist inspections and results, actions taken to resolve issues, emergency repairs needed to control erosion/sedimentation;
  - quarries, borrow areas, spoil areas, batch plants: identify major activities undertaken this month at each, and highlights of environmental and social protection: land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation;
  - blasting: number of blasts (and locations), status of implementation of blasting plan (including notices, evacuations, etc.), incidents of off-site damage or complaints (cross-reference other sections as needed);
  - spill cleanups, if any: material spilled, location, amount, actions taken, material disposal (report all spills that result in water or soil contamination;
  - waste management: types and quantities generated and managed, including amount taken offsite (and by whom) or reused/recycled/disposed on-site;
  - details of tree plantings and other mitigations required undertaken this month;
- compliance:
  - compliance status for conditions of all relevant consents/permits, for the Work, including quarries, etc.): statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance;
  - compliance status of ESMP/CESMP requirements: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance, status of all non-conformances identified during audits and inspections that are identified by non-compliance notices.

- other unresolved issues from previous months related to environmental and social: continued violations, continued failure of equipment, continued lack of vehicle covers, spills not dealt with, continued compensation or blasting issues, etc. Cross-reference other sections as needed.

The Contractor will have a duty to immediately and within 24 hours report to the Engineer if any serious environmental breach has occurred during construction e.g., clearing of sensitive areas, serious oil spills etc. This including serious accident cases and fatality.

Engineer Reporting – The Engineer will prepare two levels of environmental reports as follows:

a) Monthly Environmental Report – prepared by the NESS and submitted to the PMU. This monthly report will summarize the Contractors environmental social and health and safety performance based on the Contractors weekly checklists and the weekly site visits by the NESS.

b) Quarterly Environmental Report – prepare by the IESS and submitted to the PMU and EIB, this report will be more detailed that the monthly monitoring reports and will include findings of the IESS site visits to the Contractors work sites and camps.

The Engineer will have a duty to within 24 hours report to the PMU and EIB if any serious environmental breach has occurred during construction e.g., clearing of sensitive areas, serious oil spills etc. This including serious accident cases and fatality.

PMU Reporting – The ESMU/PMU will prepare six month and annual safeguard progress report and submit to the EIB.

4.8. EIB responsibilities

In regard to implementation of environmental and social safeguards requirements for the project include undertaking periodic monitoring of the ESMP / CESMP implementation and due diligence as part of an overall project review mission, and if required, providing advice to the PMU in carrying out its responsibilities to implement the ESMP for the project.

4.9. EDPD/PTI ESMU Capacity Building Requirements

The ESMU has experienced Safeguard Specialists with experience of oversight of these types of road rehabilitation projects. However, ESMU capacity to implement and supervise implementation of mitigation measures and monitoring program that meet international best practices could be further strengthened. The engineer's International Environmental and Social Specialist tasks will include strengthening the capacity of ESMU to implement and monitor environmental and social mitigation measures and monitoring as specified in the project ESIA/ESMP.

4.10. ESMP Costs

Most costs associated with the environmental recommendations of the ESMP are a normal part of preparing the bid and contract documents and ensuring that proper environmental provisions are incorporated therein. The installation of septic systems at construction camps, for example, is an environmental necessity, but not generally considered an "environmental cost". Table 14_lists the proposed mitigation measures and indicates where they would be

"included in the project budget" as part of a bid document and where additional costs are a likely "environmental cost" beyond what would normally be included in a project budget.

Table 14: ESMP Mitigation Costs

Activity	Item	Number of Units / Unit cost	Cost estimate / US$	Responsibility
Pre-construction				
CESMP	CESMP and associated plans	Included in Project Budget	-	Contractor
Approval of Camp locations	Approval	Included in Project Budget	-	PMU / Engineer
Incorporation of Environmental Items into Bid Documents	Item in Bid Document	Included in Project Budget	-	PMU
Obtain permits	Permits	Included in Project Budget	-	Contractor
Noise consultations	Consultations	Lump sum	$5,000	MPWT
Noise abatement	Noise model (if needed)	Lump sum	$25,000	MPWT
Construction				
Standard site management Additional environmental measures	Septic Tanks	Included in Project Construction costs	-	Contractor
	Spill Kits	10 / US$200	$2,000	Contractor
	Bunds for fuel and oil storage	Included in Project Construction costs	-	Contractor
	Waste containers	Included in Project Construction costs	-	Contractor
	Waste Storage areas	Included in Project Construction costs	-	Contractor
	Waste collection and disposal	Included in Project	-	Contractor

Activity	Item	Number of Units / Unit cost	Cost estimate / US$	Responsibility
		Construction costs		
	Storage areas for hazardous materials	Included in Project Construction costs	-	Contractor
	Sprinklers for rock crushing plant	Included in Project Construction costs	-	Contractor
	Drainage (including oil and grease interceptors)	Included in Project Construction costs	-	Contractor
	Vehicle washing bay	Included in Project Construction costs	-	Contractor
	Fire safety	Included in Project Construction costs	-	Contractor
	PPE	Included in Project Construction costs	-	Contractor
	Impervious hardstanding (for maintenance yards, bitumen storage, etc)	Included in Project Construction costs	-	Contractor
	First aid facilities	Included in Project Construction costs	-	Contractor
	Protective barriers at school entrances	$1,000	$20,000	Contractor
	Water bowsers	Included in Project Construction costs	-	Contractor

Activity	Item	Number of Units / Unit cost	Cost estimate / US$	Responsibility
	Dust control measures (rock crushing and batching plants)	Included in Project Construction costs	-	Contractor
	Tarpaulins	Included in Project Construction costs	-	Contractor
Embankment vegetation and soil erosion measures	Vegetation, labour and maintenance	Included in Project Budget	-	Contractor
Training & Awareness Programs	Safety Training	Included in Project Budget	-	Contractor
	HIV/AIDS Training	10 / US$1,000	$10,000	Independent Contractor
	Toolbox Training	Included in Project Budget	-	Contractor
	Construction orientation meetings	Included in Project Budget	-	Contractor
	Periodic meetings with stakeholders	Included in Project Budget	-	Contractor
Clean-up of construction sites.	Labor, waste disposal	Included in Project Budget	-	Contractor
Environmental Staff	ESM OSHM CLO ECOW	24 / US$ 2,000 24 / US$ 2,000 24 / US$ 2,000 12 / US$ 2,000	$48,000 $48,000 $48,000 $24,000	Contractor Contractor Contractor Contractor
	IESS	4 / US$ 12,000	$48,000	Engineer
	NESS NOHSS	12 / US$ 2,000 12 / US$ 2,000	$24,000 $24,000	Engineer Engineer
Total			$326,000	

Table 15: ESMP Instrumental Monitoring Costs

Monitoring	Parameters	Frequency	Location	Responsibility	Costs
Construction Phase Air Quality					
Instrumental	NOx, SO2, PM10, PM2.5	Monthly or when complaints are received from residents	At baseline locations and at locations of complaints	Contractor	100 USD per sample.

Monitoring	Parameters	Frequency	Location	Responsibility	Costs
Construction Phase Water Quality					
Surface Water Quality	Per national standards	Monthly during bridge construction works	At all bridge construction sites	Contractor	250 USD per site.
Camp discharge water (if applicable)	Per Project Standards	Monthly	Camp sites, batching plants, rock crushing plant	Contractor	250 USD per site.
Drinking Water	Per national standards	Monthly	Construction camps	Contractor	200 USD

Monitoring	Parameters	Frequency	Location	Responsibility	Costs
Construction Phase Noise and Vibration					
Noise	Leq	Monthly or when complaints are received from residents	At baseline locations and at locations of complaints	Contractor	100 USD per sample.
Vibration	PPV	Continuously	At sites identified by the CVMP	Contractor	2,500 USD per vibration monitoring unit
Operational Phase Noise					
Noise	Leq	Annually	At baseline locations	MPWT	100 USD per sample

4.11. ESMP Implementation summary

The following Table summarizes the various institutional responsibilities for the implementation of the environmental management plan at various stages of the Project.

Table 16: ESMP Implementation

Project Stage	Responsible Institution	Responsibilities
Concept Design	Concept Designers	• Incorporate Impact minimizing ESMP mitigation measures into concept design.
Detailed Design	PMU with the Contractor, ISWS and ESIA Team.	• Incorporate ESMP mitigation measures into final design.
	PMU	• Ensure ESMP is incorporated into the works Contracts.
	PMU	• Review Contractors proposals to ensure that they are aware of the ESMP requirements and that line items for environmental management as per the ESMP are included in the BOQ.
Pre-construction	Contractor	• Prepare CESMP • Obtain all necessary environmental and social related permits for construction.
	EIB	• Review CESMP and provide comments, if requested
	PMU	• Review CESMP based on recommendation from the Engineer
	ISWS	• Review CESMP and provide recommendations
	Contractor and ISWS	• Site Induction
Construction	Contractor (through its ESM)	• Daily monitoring of environmental and social issues. • Preparation of weekly environmental and social checklists. • Preparation of monthly and quarterly environmental and social reports. • Preparation of the dedicated environmental and social monitoring report (annually). • Preparing Corrective action plans. • Reporting accidents to the ISWS
	PMU	• Routine site visits to monitor Contractors environmental and social performance.
	ISWS	• Weekly monitoring of the Contractors compliance with ESMP / CESMP by the NESS. • Issuing the Contractor with Non-compliance

Project Stage	Responsible Institution	Responsibilities
		Notices. • Monthly reporting to PMU of Contractors performance based on the review of Contractors weekly checklists and weekly site visits. • Quarterly Environmental and Social Reports prepared by the IESS and submitted to PMU/PTI and EIB. • Instrumental Environmental monitoring. • Reporting accidents to the PMU

5. MITIGATION PLAN

The following tables provide the environmental mitigation plans for the design, pre-construction, construction and operational phases of the Project. The plans, organized by ESIA topics identify:

a) Potential Impacts and Risks

b) Mitigation measures for each (or groups of) identified risks and impacts

c) Reference to specific implementation plans

d) The responsibilities for implementing the mitigation

e) Mitigation costs

Table 17: Environmental and Social Management Plan - Design Phase

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
Standard 1: Environmental and Social Impacts and Risks **ESS1: Assessment and Management of Environmental and Social Risks and Impacts**						
ESIA and associated plans	Mitigation measures not included in designs	Ensure the design phase mitigations in the ESMP are included in updated concept design and Contractors detailed designs. Implementation Plan: • ESMP	All ESMP design measures included in concept and detailed designs (where relevant).	EIB Standard 1 Environmental Protection Law (2012) Decree on Environmental Impact Assessment (2022) All Project standards as outlined in the Project ESIA.	CDC and Contractor to ensure measures are included in designs Engineer to review designs.	N/A
Standard 3: Resource Efficiency and Pollution Prevention **Standard 5: Climate Change** **ESS3: Resource Efficiency and Pollution Prevention and Management**						
Climate Change	Drainage	Include the following in designs: • Bridges: flood return frequency of 100 years; • Box culverts and short bridges ≤ 10 m	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019)	Concept Design Consultant to include measure in designs Contractor to include in detailed designs	Part of Construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		span: flood return frequency of 50 years; • Road and pipe culvert < 2 m diameter: flood frequency of 25 years; • Side drains and ditches: flood frequency of 10 years. Implementation Plan: • Report on Climate Change • Detailed Design • ESMP		United Nations Framework Convention on Climate Change (UNFCCC 1995).	Engineer to review final design documents prior to the start of construction.	
	Pavement Disruption due to overtopping during intense rain	Raising of flood-prone areas above the calculated flood levels. Not included in the concept design, to be confirmed in the Detailed Design. Implementation Plan: • Report on Climate Change • Detailed Design • ESMP	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019) United Nations Framework Convention on Climate Change (UNFCCC 1995). ESS3	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	Part of Construction costs
	Pavement Rutting and bleeding due to hot climate	Use of harder grade bitumen Improved asphalt mixes to resist rutting (mix design using asphalt rutting test). Appropriate Asphalt mix design to be defined during detailed design and construction.	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019)	Concept Design Consultant to include measure in designs Contractor to include in detailed designs	Part of Construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		Implementation Plan: • Report on Climate Change • Detailed Design • ESMP		United Nations Framework Convention on Climate Change (UNFCCC 1995). ESS3	Engineer to review final design documents prior to the start of construction.	
	Pavement Deformation due to moisture variations	Lime or cement stabilization of sub-base and base. Not envisaged if the pavement sub-base is placed above the design flood level, To be further defined during detailed design. Implementation Plan: • Report on Climate Change • Detailed Design • ESMP	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019) United Nations Framework Convention on Climate Change (UNFCCC 1995). ESS3	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	Part of Construction costs
	Pavement Reduced life due to insufficient bearing capacity	Use of concrete pavement in flood plains. Used in selected areas. To be further defined during detailed design. Implementation Plan: • Report on Climate Change • Detailed Design • ESMP	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019) United Nations Framework Convention on Climate Change	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of	Part of Construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
				(UNFCCC 1995). ESS3	construction.	
	Bridges - Increased scour due to debris flows	Scour protection of piers. Included in the concept design, to be confirmed in the Detailed Design. Implementation Plan: • Report on Climate Change • Detailed Design • ESMP	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019) United Nations Framework Convention on Climate Change (UNFCCC 1995). ESS3	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	Part of Construction costs
	Bridges - Overtopping during intense rainfall	Hydraulic capacity of Bridges and resulting opening of bridges calculated with 15% safety coefficient. Included in the concept design, to be confirmed in the Detailed Design. Implementation Plan: • Report on Climate Change • Detailed Design • ESMP	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019) United Nations Framework Convention on Climate Change (UNFCCC 1995). ESS3	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	Part of Construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
	Culverts - Overloading during intense rainfall	Hydraulic capacity of culverts calculated with 15% safety coefficient and considering 25 / 50-year flood return periods. Included in the concept design, to be confirmed in the Detailed Design. Implementation Plan: • Report on Climate Change • Detailed Design • ESMP	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019) United Nations Framework Convention on Climate Change (UNFCCC 1995). ESS3	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	Part of Construction costs
	Side slopes - Erosion due to intense rainfall, section of unstable slope	Vetiver planting for slope stabilization, slope protection by wall, rip-rap and etc., Not included, as with climate and fast-growing plantations in Lao, it is naturally achieved to be confirmed in the Detailed Design. Implementation Plan: • Report on Climate Change • Detailed Design • ESMP	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019) United Nations Framework Convention on Climate Change (UNFCCC 1995). ESS3	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	Part of Construction costs
	Side slopes near river bank - Scouring during high river levels	River Bank protection considered in selected locations. Identified at new construct bridge location and included in the concept design, to be confirmed in the Detailed Design.	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change	Concept Design Consultant to include measure in designs Contractor to include	Part of Construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		Implementation Plan: • Report on Climate Change • Detailed Design • ESMP		(2019) United Nations Framework Convention on Climate Change (UNFCCC 1995). ESS3	in detailed designs Engineer to review final design documents prior to the start of construction.	
Hydrology	Culverts	Per the climate change mitigation measures above. Implementation Plan: • Report on Climate Change • Detailed Design • ESMP	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019) United Nations Framework Convention on Climate Change (UNFCCC 1995). ESS3	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	N/A
	Flooding	Per the climate change mitigation measures above. Implementation Plan: • Report on Climate Change • Detailed Design • ESMP	All measures included in designs	EIB Standard 3 EIB Standard 5 Decree on Climate Change (2019) United Nations Framework Convention on	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of	N/A

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
				Climate Change (UNFCCC 1995). ESS3	construction.	
	Drainage	Designs shall ensure that the drains discharge to existing drainage ditches of suitable capacity, or to streams without causing erosion of embankments, flooding, or damage to properties. Prior to discharge from the longitudinal drains, the water should pass through an oil / grease interceptor or control valves. Implementation Plan: • ESMP	All measures included in designs	EIB Standard 3 ESS3 Environmental Protection Law (2012) Decree on National Environment Standard dated 81/GV, dated 21 Feb. 2017	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction..	N/A
	Bridges	Bridge designs will ensure that drainage from bridge decks over 50 meters does not discharge directly to the watercourses beneath the bridges. The bridge run-off waters will lead to an interceptor tank, or filter pond adjacent to the bridge in order to trap oil and grease run-off. Implementation Plan: • ESMP	All measures included in designs	EIB Standard 3 ESS3 Environmental Protection Law (2012) Decree on National Environment Standard dated 81/GV, dated 21 Feb. 2017	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	N/A
		The bridge design and layout must also be	No complaints from	EIB Standard 3	Concept Design	N/A

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		aesthetically pleasing and in harmony with the existing environment. Implementation Plan: • ESMP	community regarding aesthetic impact of bridges.	ESS1	Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	
Geohazards	Earthquakes	Ensure that all Project components are designed and constructed in accordance with national design standards for earthquakes. Implementation Plan: • ESMP	Designs include earthquake loading for structures. No major damage to structures during operation.	National building codes EIB Standard 3 ESS3	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	N/A
	Slope Protection	Ensure that detailed designs include all the specified slope protection measures outlined in the concept design and discussed in the Project Description section of this report. Implementation Plan: • ESMP	Designs include earthquake loading for structures. No major damage to structures during operation.	National building codes EIB Standard 3 ESS3	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	N/A
Noise	Elevated noise	MPWT undertakes a program of consultation	Consultation completed	National	MPWT to undertake	5,000

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
	levels	with stakeholders within the Project corridor to determine views on elevated noise levels. If stakeholders do not think noise is a significant issue and they are not concerned about increases in noise levels no further actions should be considered during this stage of the Project. However, routine monitoring of noise levels along the road, (at building facades) should be undertaken annually to assess how noise levels are changing year or year. If stakeholders feel that noise is a significant issue and that they are concerned about increases in noise levels the MPWT should prepare a noise model to determine the exact nature and extent of any noise levels increase over the next 20 years. The model should be part of a report that recommends precise mitigation measures, or a combination of measures, to reduce noise levels. The MPWT would then have to consult with the stakeholders to confirm that they are willing to accept the proposed mitigation measures and then implement the noise mitigation measures. Implementation Plan: • ESMP	and decisions documented. Model completed or annual monitoring completed.	Standards for noise: Noise Standards for Other Places (LAeq 24-hrs) EIB Standard 3 ESS3	consultations, monitoring and modeling as necessary.	USD for consultations 25,000 USD for noise model (if needed)
Standard 9: Health, Safety and Security **ESS4: Community Health and Safety**						

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
Community Health and Safety	Health and Safety	Traffic safety issues will be accounted for during the design phase of the Project. Safety signs will be included in the design warning people not to attempt to cross the four-lane section of the road without using dedicated crossing areas. Project sticker with contact information of site supervisor should put on all contractor's, sub-contractor's vehicles and equipment and all projects vehicles and equipment. Implementation Plan: • ESMP	Traffic safety measures included in design documents. Traffic accidents decrease during operational phase.	EIB Standard 9 ESS4 National road safety standards	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	N/A
	Road Crossings	Designs to include suitable road crossings outside of schools and markets and at regular intervals in urban areas. Speed bumps should be considered outside all schools along the alignment. Implementation Plan: • ESMP	Traffic safety measures included in design documents. No accidents outside of schools.	EIB Standard 9 ESS4 National road safety standards	Concept Design Consultant to include measure in designs Contractor to include in detailed designs Engineer to review final design documents prior to the start of construction.	N/A

Table 18: Environmental and Social Management Plan – Pre-construction Phase

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
Standard 1: Environmental and Social Impacts and Risks **ESS1: Assessment and Management of Environmental and Social Risks and Impacts**						
Permits and Licenses	Tree cutting, borrow pits, camp sites, ancillary plant and water extraction	Obtain all necessary permits and licenses to operate these facilities. Implementation Plan: • CESMP	All permits in place before construction commences (or specific construction activities commence).	EIB Standard 1 ESS1 Permits per table 44 of the ESIA.	Contractor to obtain permits. Engineer to review permits.	N/A
Staff	Lack of E&S staff	the Contractor, ISWS and PMU to ensure that E&S staffing is in place as per the ESMP Implementation Plan: • ESMP	E&S staff hired according to the requirements of the ESIA.	EIB Standard 1 ESS1	MPWT to ensure staffing is in place	Staffing costs – see Table 13
Stipulated Contractual Penalties	Repeated non-compliance on key ES impacts	Stipulate more stringent contractual penalties (in case of repeated non-compliance on key ES impacts that could lead to serious or severe E&S incident including road safety, community safety, and delay due to coordination among concerns agencies). Implementation Plan: • Contractual documents	Contract documents	EIB Standard 1 ESS1	MPWT to include in contractual documents.	N/A
ESMP Requirement	Preparation of CESMPs	Prepare CESMPs. Implementation Plan:	CESMP completed prior to the start of construction.	EIB Standard 1 ESS1	Contractor to prepare CESMPs including alignment sheets.	Part of general construct

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		• ESMP			Engineer to review and approve CESMPs	ion costs
	Incorporation of Items into Bid Documents	A specific environmental and social section will be included within the main Bid Documents indicating that the Contractor will be responsible for conforming with the requirements of the ESMP. Implementation Plan: • Bid documents	Items includes in bid documents.	EIB Standard 1 ESS1	MPWT to ensure ESMP is included within Bid Documents.	N/A
Standard 8: Labour Rights **Standard 9: Health, Safety and Security** **ESS2: Labor and Working Conditions**						
Economy and Employment	Employment conditions not aligned with EIB standards	Contractor to follow requirements of LMP Implementation Plan: • LMP	LMP Non-compliances	EIB Standard 8 EIB Standard 9 ESS2	Contractor	Per the LMP
	Roadside Vendors	Set aside specific areas for road vendors to continue to operate throughout the construction phase. The area should be located within at least 50 meters of the project road and should be sized to accommodate all road vendors. The site should be clearly signposted for traffic and an all-weather track provided to the site with parking space.	Area set aside for vendors prior to the commencement of works.	EIB Standard 8 EIB Standard 9 ESS2	Contractor & MPWT	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		Implementation Plan: • ESMP • RAP				
	Scheduling of Works	The schedule for civil works will be divided into sections comprising several work sites each with specific arrangements custom designed for the affected community. Contingencies for unaccounted disturbances to scheduling will be included in the works schedule. Implementation Plan: • Contract Documents	Schedule provided in contract documents.	EIB Standard 8 EIB Standard 9 ESS2	Contractor	N/A
	Access	Prior to the start of works in any location prepare dedicated temporary pathways to all businesses that might otherwise be cut off from the road during the construction phase. The pathways must be wide enough to allow access to the business and must be kept free of mud and construction debris and should not be liable to flooding. Implementation Plan: • ESMP	Complaints from community of businesses regarding access.	EIB Standard 8 EIB Standard 9 ESS2	Contractor	Part of general construction costs
Workers' Rights and Occupational Health and Safety (OHS)	Worker Health and Safety	Prepare an Occupational Health and Safety Plan (OHS Plan) including the elements specified in the Project ESIA. Ensure that sub-contractors are provided with	Plan prepared and approved. Plan provided to sub-contractors	Decree on Occupational Safety and	Contractor to prepare OHS Plan. Contractor to provide copies of the CESMP to sub-contractors prior	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		copies of the CESMP. Implementation Plan: • OHS Plan / ESMP		Health (2019) EIB Standard 8 EIB Standard 9 ESS2	to their access to the site. Engineer to review and approve OHS Plan.	
		Initial Safety Induction Course: All workmen will be required to attend a safety induction course before they are allowed access to the Site. Implementation Plan: • OHS Plan	Induction completed for 100% of workforce	Decree on Occupational Safety and Health (2019) EIB Standard 8 EIB Standard 9 ESS2	Contractor	Part of general construction costs
	Traffic Safety	Submit a Traffic Management Plan (TMP) to PMU and local traffic authorities prior to mobilization. Implementation Plan: • TMP	TMP prepared and approved.	National Road safety standards EIB Standard 8 EIB Standard 9 ESS2	Contractor to prepare TMP. Engineer to approve TMP.	Part of general construction costs
	UXO	Prior to the start of any works the Contractor will consult with the relevant regulatory authorities to confirm that the construction area is clear of any UXO. If this cannot be confirmed the Contractor (through an approved sub-contractor) will be responsible for surveying the construction areas (including ancillary facilities, such as borrow pits and	UXO Clearances provided.	EIB Standard 8 EIB Standard 9 ESS2	Contractor to consult with relevant regulatory authorities. Sub-contractor to survey the site, if required. Contractor to provide	N/A

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		access roads) and confirming that the work sites are free of UXO. The Contractor will provide, in writing, the findings of the survey to the Engineer. If any UXO is found on site the Contractor, through his approved sub-contractor, will be responsible for removing any UXO. Implementation Plan: • OHS Plan • ESMP			the results of the survey to the Engineer.	
Standard 3: Resource Efficiency and Pollution Prevention **ESS3: Resource Efficiency and Pollution Prevention and Management**						
Air Quality	General construction impacts	Preparation of an Air Quality Plan (AQP) including the location of haul routes and other elements as specified in the Project ESIA. Implementation Plans: • CSEMP • AQP	Plan prepared and approved.	Decree on Promulgation of National Environmental Standards (2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017 EIB Standard 3 EEE3	Contractor to prepare AQP Engineer to review and approve AQP.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Air quality impacts from stationary sources	Locations for quarry sites, borrow pits and concrete batching plants will require approval from the Engineer and PONRES. No quarry, borrow pit or batching plant will be located within 2 km of protected areas or within 500 meters of sensitive receptors or urban areas. Implementation Plans: • CSEMP • AQP	Permits and licenses. Documented evidence of site location.	Decree on Promulgation of National Environmental Standards (2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017 EIB Standard 3 EEE3	Contractor to select sites. Engineer and PONRE to approve sites.	N/A
Hydrology	General construction impacts	Prepare and implement a Pollution Prevention Plan (PPP). The plan must provide details on wastewater (sewage) volume, disposal scheme, information on capacity and type of wastewater treatment facility, location of the discharge point/points with indication of coordinates. Implementation Plans: • PPP • CESMP	Plan prepared and approved.	Decree on Promulgation of National Environmental Standards (2017) Law on Water and Water Resources (2017) EIB Standard 3 EEE3	Contractor to prepare PPP Engineer to review and approve PPP.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Bridges	Prepare and implement Bridge Construction Plan (BCP) - outlining the schedule of bridge construction and environmental management measures for each bridge location, including protection of biodiversity. Implementation Plans: • BCP • CESMP	Plan prepared and approved.	EIB Standard 3 EEE3	Contractor to prepare BCP Engineer to review and approve BCP.	Part of general construction costs
	Camp sites water management	Prepare and implement a construction Camp Management Plan (CCMP) which will form part of the CESMP. The Plan will indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, septic tanks, etc. Implementation Plans: • CCSP • CESMP	Plan prepared and approved.	Decree on National Environment Standard dated 81/GV, dated 21 Feb. 2017 EIB Standard 3 EEE3	Contractor to prepare CCMP Engineer to review and approve CCMP.	Part of general construction costs
	Siting of facilities	No construction camp, permanent or temporary, will be located within 200 meters of any or irrigation channel (not including drainage channels). Implementation Plans: • CCMP • CESMP	Documented evidence of site location.	Decree on National Environment Standard dated 81/GV, dated 21 Feb. 2017 EIB Standard 3 EEE3	Contractor to select sites. Engineer to approve sites.	N/A

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
Soils	Loss of productive soils	Compensation payments for loss of land completed according to RAP requirements. Implementation Plans: • RAP	Documented evidence of payments per requirements of the RAP.	EIB Standard 3 EEE3	MPWT to make compensation payments	Per RAP
	Emergencies	Prepare and implement an Emergency Response Plan (ERP), which will cover containment of hazardous materials, oil spills, and work-site accidents and will be applicable to all phases of the Project. Specific requirements of ERP per the ESIA shall be included. Implementation Plans: • ERP • CESMP	Plan prepared and approved.	EIB Standard 3 EEE3 ESS4	Contractor to prepare ERP Engineer to review and approve ERP.	Part of general construction costs
	Topsoil	Prepare and implement a topsoil management plan (TSMP) in accordance with the requirements of the ESIA. Implementation Plans: • TSMP • CESMP	Plan prepared and approved.	EIB Standard 3 EEE3	Contractor to prepare TSMP Engineer to review and approve TSMP	Part of general construction costs
	Suitability of borrow pits	No Project borrow pits will be utilized that are located within 2km of protected areas or within 500 m of urban areas and sensitive receptors.	Documented evidence of site location.	EIB Standard 3 Environmental Protection Law (2012)	Contractor to select sites. Engineer to approve sites.	N/A

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		Implementation Plans: • ESMP		Wildlife and Aquatic Law (2008) Forestry Law (2021) ESS3 ESS6		
	New Quarry Sites	Any new quarries must obtain the required permits prior to commencement of works at these sites, this will include approval from PONRE and the Engineer. No quarry will be located within 500 meters of any urban area, sensitive receptor or within 2 kilometers of a protected area. Implementation Plans: • ESMP	Permits and licenses.	EIB Standard 3 Environmental Protection Law (2012) Wildlife and Aquatic Law (2008) Forestry Law (2021) ESS3 ESS6	Contractor to select quarry sites and apply for approval from PONRE and any other regulatory agencies as necessary. Engineer to review quarry locations, licenses and approvals from PONRES.	Part of general construction costs
	Existing Borrow Pits	For all existing borrow pits/quarries proposed for use by Contractor, a due diligence review including a review of borrow pits/quarry locations, licenses and approvals from PONRES and other regulatory agencies will be carried out by the Engineer during project implementation (pre-construction phase) to determine their suitability and ensure that the borrow pits/quarries are not within 2 kms from	Due diligence review completed.	EIB Standard 3 Environmental Protection Law (2012) Wildlife and Aquatic Law (2008) Forestry Law	Engineer to undertake due diligence review. Results of the due diligence review will be presented to PMU and Contractor clearly stating the reasons for any rejection of the	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		protected areas; and not within 500 meters from sensitive receptor. For all existing borrow pits/quarries, the Engineer will consult with PONRES to confirm the exact distance from protected areas and to ensure the borrow pits are not located within 2 kms from protected areas; and not within 500 meters from sensitive receptor. The due diligence review will be undertaken before the Contractor signs any contract with the existing borrow pit owner. Implementation Plans: • ESMP		(2021) ESS3 ESS6	site.	
	New Borrow Pits	Obtain all necessary permits from the regulatory authorities. Prepare a Borrow Pit Action Plan (BAP) No borrow pit will be located within 2 kilometers of a protected area. Arrangements for opening and using material borrow pits will contain enforceable provisions. Implementation Plans: • ESMP • BAP	Permits and licenses. BAP completed and approved. Documented evidence of site location.	EIB Standard 3 Environmental Protection Law (2012) Wildlife and Aquatic Law (2008) Forestry Law (2021) ESS3 ESS6	Contractor to select borrow sites and apply for approval from PONRES and any other regulatory agencies as necessary. Engineer to review borrow locations, licenses and approvals from PONRE.	Part of general construction costs
Waste Management	Management of waste materials	Preparation and implementation of a waste management and recycling plan (WMRP)	Plan prepared and approved.	EIB Standard 3 Environmental	Contractor to prepare WMRP	Part of general

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		Implementation Plans: • WMRP • CESMP		Protection Law (2012) Decision on the Management, Monitoring, and Inspection of the Treatment and Disposal of Contaminated and Hazardous Waste No. 3649/MONRE (2021) ESS3	Engineer to review and approve WMRP	construction costs
		Preparation of a construction camp management plan to manage liquid wastes. Implementation Plans: • CCMP • CESMP	Plan prepared and approved.	EIB Standard 3 Environmental Protection Law (2012) Decision on the Management, Monitoring, and Inspection of the Treatment and Disposal of Contaminated and Hazardous Waste No. 3649/MONRE (2021) ESS3	Contractor to prepare CCMP Engineer to review and approve CCMP	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		Perform a due diligence review of the waste management contractors' facilities to ensure that they follow Lao PDR regulatory requirements. Implementation Plans: • WMRP • CESMP	Due diligence review completed.	EIB Standard 3 Environmental Protection Law (2012) Decision on the Management, Monitoring, and Inspection of the Treatment and Disposal of Contaminated and Hazardous Waste No. 3649/MONRE (2021) ESS3	Engineer to undertake due diligence review.	Part of general construction costs
Construction Camps and Plant	Selection of Construction Camp Site	Preparation of a Construction Camp Management Plan. Preparation of a Spills Response Plan (SRP). Coordinate all construction camp activities with neighboring land uses. Implementation Plans: • CCMP • SRP	Plans prepared and approved.	EIB Standard 3 Environmental Protection Law (2012) ESS3	Contractor to prepare CCMP & SRP Engineer to review and approve CCMP & SRP	Part of general construction costs
Noise and Vibration	Vibration	Preparation and implementation of a Construction Vibration Management Plan (CVMP)	Plan prepared and approved.	EIB Standard 3 ESS3	Contractor to prepare Plan Engineer to review and	Part of general construct

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		Implementation Plans: • CVMP • CESMP		DIN 4150-3, Structural Vibration, Part 3: Effect of vibration on structures	approve Plans.	ion costs
		Pre-condition surveys of properties. Implementation Plans: • CVMP • CESMP	Surveys completed	EIB Standard 3 ESS3 DIN 4150-3, Structural Vibration, Part 3: Effect of vibration on structures	Contractor & Engineer to complete surveys.	Part of general construct ion costs
Standard 9: Health, Safety and Security **ESS4: Community Health and Safety**						
Community Health and Safety	Traffic Management	Preparation and implementation of a TMP that will outline how he will manage issues relating to transport of materials and staff, road closures, diversions, safety signs, etc. Implementation Plans: • TMP	Plans prepared and approved.	EIB Standard 9 ESS4 National road safety standards	Contractor to prepare Plan Engineer to review and approve Plans.	Part of general construct ion costs
	General Safety	Preparation and implementation of a Community Health and Safety Plan. Implementation Plans:	Plans prepared and approved.	EIB Standard 9 ESS4	Contractor to prepare Plan Engineer to review and	Part of general construct ion costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		• CHSP			approve Plans.	
Infrastructure	Damage to roads	Prior to the commencement of works a road condition survey will be undertaken by the Engineer to record the condition of access roads to borrow pits, asphalt plants, camps, etc. Implementation Plans: • CESMP	Condition survey completed prior to the start of works.	EIB Standard 9 ESS4	Engineer to complete road condition survey.	Part of general construction costs
	Public Utility	Public utility relocation will be done with good coordination and contract preparation upfront to avoid delay of works and poor relocation planning. Implementation Plans: • CESMP	Complaints from the community.	EIB Standard 9 ESS4	Contractor to manage utilitiy removal coordination with utilities provider	Part of general construction costs
Standard 6: Involuntary Resettlement **ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement**						
Land Acquisition	Loss of land or use of land; Loss of crops and trees; Loss of structures and fixed assets; Livelihood impacts;	RAP implemented prior to the start of construction. Implementation Plans: • RAP	Complaints from the community.	EIB Standard 6 Decree #84 on Compensation and Resettlement of People Affected by Development Projects (2016)	MPWT to implement RAP conditions.	As Per RAP

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Allowances, assistance, and livelihood restoration; and Temporary impact during construction			Technical Guidelines on Compensation and Resettlement of People Affected By Development Project (2005) ESS5		
Standard 4: Biodiversity and Ecosystems **ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources**						
Designated Sites	General impacts	Implement the requirements of the Project BMP. Implementation Plans: • BMP	BMP Non-compliances	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (20**21**) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement BMP	Per BMP
Flora and Fauna	Tree cutting	Tree cutting and tree replanting will be undertaken according to the law of the GoL.	Fines for illegal cutting of trees	EIB Standard 4 Wildlife and Aquatic Law	Contractor to undertake tree cutting. Relevant regulatory	Part of general construct

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		Implementation Plans: • BMP		(2008) Forestry Law (20**21**) United Nations Convention on Biodiversity (CBD 1996 ESS6	Authority (District Forest Office) to monitor tree cutting.	ion costs
Standard 10: Cultural Heritage **ESS8: Cultural Heritage**						
Cultural Heritage	Chance Finds	The Contractor will prepare a chance find procedure in line with the requirements of the GOL. Implementation Plans: • ESMP • Chance find procedure	Chance find procedure prepared Complaints registered by the Civil Society Organizations.	EIB Standard 10 Law on National Heritage (2014) Decree on the Preservation of Cultural, Historical and Natural Heritage (1997) ESS8	Contractor to prepare Plans Engineer to review and approve Plans.	Part of general construct ion costs
Standard 2: Stakeholder Engagement **ESS10: Stakeholder Engagement and Information Disclosure**						
Stakeholder	Stakeholder	Four weeks prior to the Contractor starting works in any village or town he will be	Meeting records and	Public	Contractor	N/A

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
Engagement	consultations	responsible for holding a works orientation meeting within the village / town and will invite members of the public and village officials. The purpose of the meeting is to summaries the scope of works, the schedule and to provide copies of the GRM. Implementation Plans: • SEP • ESMP	photos	Involvement Guideline (2012) EIB Standard 2 ESS10		
Greivances	No GRM in place	The GRM will be established and communicated to the local community prior to the commencement of works. Implementation Plans: • GRM	GRM prepared Meeting records and photos	Law on Handling of Petitions (2015) EIB Standard 2 ESS10	MPWT & Contractor	N/A

Table 19: Environmental and Social Management Plan - Construction Phase

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
Standard 8: Labour Rights **Standard 9: Health, Safety and Security** **ESS2: Labor and Working Conditions**						
Economy and Employment	General Labour and working conditions	Implement the measures outlined in the Project Labour Management Plan (LMP) Implementation Plans: • LMP	LMP non-compliances	EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement LMP	Per the LMP
	Use of Local Labour	Unskilled labour force - the Contractor will be instructed to place emphasis the labour force within the project area to minimize on the labour force immigration into the project area. Skilled labour – the Contractor/Consultant will be advised to follow a recruitment procedure applied by WB and EIB as stated in the LMP. The Contractor/Consultant will have to demonstrate these required procedures. The Contractor/Consultant is recommended to employ local laboratory staff where necessary based on skilled and availability of labour force. Implementation Plans: • LMP	Skilled and unskilled workers employed.	EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement mitigation	Part of general construction costs
	Access	Access to businesses must be always maintained throughout the construction period. Prepare dedicated temporary pathways to all businesses that might otherwise be cut off from	Complaints from community	EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement mitigation	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		the road during the construction phase. The pathways must be wide enough to allow access to the business and must be kept free of mud and construction debris and should not be liable to flooding. Implementation Plans: • CESMP				
Workers' Rights and Occupational Health and Safety (OHS)	Risk Assessment	Risk Assessment and Risk Register to enable the safe systems of work to be identified and any PPE requirements ascertained. Implementation Plans: • OHS Plan	Risk assessment complete Risk Register Grievance Register	Decree on Occupational Safety and Health (2019) EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement mitigation	Part of general construction costs
	Training	Safety Training Program. A Safety Training Program is required and will consist of: • Initial Safety Induction Course • Periodic Safety Training Courses • Safety Meetings • Safety Inspections. • See ESIA for full training requirements. Implementation Plans: • OHS Plan	Training records	Decree on Occupational Safety and Health (2019) EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement mitigation	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Accidents	Keep a log of both training records and safety incidents including near misses. Implementation Plans: • OHS Plan	Log book	Decree on Occupational Safety and Health (2019) EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement mitigation	Part of general construction costs
		Audits and inspections of Contractor's accident logs. The Engineer should review and critique, in a timely manner, regular reports and incident reports submitted to the Engineer and to provide advice to ensure the accuracy and efficacy of the documentation. Implementation Plans: • ESMP	Audit completed	EIB Standard 8 EIB Standard 9 ESS2	Engineer to complete audit and inspections	Part of general construction costs
	PPE	Workers will be provided (before they commence works) with appropriate PPE suitable for electrical work such as safety boots, helmets, gloves, protective clothes, goggles, and ear protection at no cost to the workers. Implementation Plans: • OHS Plan	Relevant PPE provided for all workers	Decree on Occupational Safety and Health (2019) EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement mitigation	Part of general construction costs
	HIV / AIDS	Subcontract with a Service Provider to provide	Training records	EIB Standard 8	Contractor to	Part of

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		an HIV Awareness Program to the Contractor's Personnel and the Local Community. Repeat the HIV Awareness Program at intervals not exceeding four months. Implementation Plans: • OHS Plan		EIB Standard 9 ESS2	implement mitigation. Service Provider to implement training. Engineer to review program.	general construction costs
	Worker Health & safety	All construction plant and equipment used on or around the Site will be fitted with appropriate safety devices. These will include but not be limited to: • Effective safety catches for crane hooks and other lifting devices, and • Functioning automatic warning devices and, where applicable, an up-to-date test certificate, for cranes and hoists. Zones with noise level above 80 dBA must be marked with safety signs and appropriate PPE must be worn by workers above 85 dBA. Portable toilet facilities for workers at road work sites will be provided. Fencing on all areas of excavation greater than 2m deep will be installed along with warning signs. Supports will be fitted in all excavated areas. Do not enter confined space unless additional measures have been implemented, including gas detection. Ensure sufficient fresh air supply to confined	Record of accidents, near misses and corrective actions	Decree on Occupational Safety and Health (2019) WBG EHS Guidelines EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		work spaces. Workers will be provided with specific training relating to confined spaces. Keep air inlet filters clean and free of dust and microorganisms. Ensure reversing signals are installed on all construction vehicles. Implement fall prevention and protection measures whenever a worker is exposed to the hazard of falling more than two meters, falling into operating machinery or through an opening in a work surface. Note: fall prevention/protection measures may include, if unavoidable, the installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area, proper use of ladders and scaffolds by trained employees, use of fall prevention devices, including safety harnesses and lanyard travel limiting devices to prevent access to fall hazard, fall protection devices such as full body harnesses, etc. Mark the areas where risk of injuries from falling objects exist with rope or flagging to minimize risks and injuries. Provide spotters. Employ flag persons to control traffic when construction equipment is entering or leaving the work area. A suitably staffed and equipped health clinic for all workers is to be provided on site. First aid kits (compliant with OSHA standard 1910.266 App. A) will be provided at all work				

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		sites. Construction camp facilities shall follow the benchmarks outlined in the IFC / EBRD Workers Accommodation: Processes and Standards Guidance Note. The note contains standards for general living facilities, dormitory facilities, sanitary and toilet facilities, canteen, cooking and laundry facilities and medical facilities. Implementation Plans: • OHS Plan				
	Sub-contractor H&S	All sub-contractors will be supplied with copies of the CESMP. Provisions to be incorporated into all sub-contracts to ensure the compliance with the CESMP. All sub-contractors will be required to appoint a safety representative who will be available on the Site. Implementation Plans: • CESMP	CESMP provided to sub-contractor Safety representatives at site	Decree on Occupational Safety and Health (2019) WBG EHS Guidelines EIB Standard 8 EIB Standard 9 ESS2	Contractor to provide CESMP. Sub-contractors to ensure compliance with CESMP	Part of general construction costs
	Vector borne disease	Effective measures will be used to ensure that water stagnant is not present around the camp site. Use of pesticides for vegetation control is prohibited. Workers will be given awareness training	Training records First aid facilities at camp sites	Decree on Occupational Safety and Health (2019)	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		relating to vector born disease and posters will be located around work sites warning workers of the potential health risks. Medicines for the treatment of vector borne diseases will be provided at the camp medical facility. Implementation Plans: • OHS Plan		EIB Standard 8 EIB Standard 9 ESS2		
	COVID	The Contractor shall follow the national regulations and guidelines relating to COVID-19. Implementation Plans: • OHS Plan	COVID cases	National COVID regulations EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement mitigation.	Part of general construction costs
	Grievances	A worker grievance redress mechanism (GRM) will be prepared and all workers will be provided with information about the GRM as part of their induction training. Implementation Plans: • Workers GRM	GRM in place and disseminated amongst workforce Number of grievances	EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement mitigation	Part of general construction costs
	Noise	Zones with noise level above 80 dBA must be marked with safety signs and appropriate PPE must be worn by workers. Implementation Plans: • OHS Plan		Decree on Occupational Safety and Health (2019) WBG EHS	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
				Guidelines EIB Standard 8 EIB Standard 9 ESS2		
	Equal wages for male and female workers	Equal wages paid to male and female workers for equivalent jobs.	Workers contracts	EIB Standard 8 EIB Standard 9 ESS2	Contractor to implement mitigation.	Part of general construction costs
Standard 3: Resource Efficiency and Pollution Prevention **ESS3: Resource Efficiency and Pollution Prevention and Management**						
Air Quality	Energy supply	Consideration should be given to the use of energy from the following sources (in order of preference): Renewable (solar) – Energy requirements for construction camps should be supplied via renewable solar power energy. These can easily be placed on the roofs of camp facilities. Low Emissions (and low noise) Generators – Low emissions, energy efficient generators are now available on the market that comply with EU Stage V (Regulation 2016/1628) emissions standard for non-road mobile machinery (NRMM). Implementation Plans: • PPP	Records of energy used at site.	Decree on Promulgation of National Environmental Standards (2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017 EIB Standard 3 EEE3	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Open burning of waste materials	No burning of debris or other materials will occur on the at any camp or construction site. Implementation Plans: • PPP	No burning of waste.	Decree on Promulgation of National Environmental Standards (2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017 EIB Standard 3 EEE3	Contractor to implement mitigation.	Part of general construction costs
	Rock-crushing plant	Rock crushing plant equipment will be fitted with water sprinklers that will run continuously while the plant is operational. Implementation Plans: • PPP	Compliance with national air quality standards	Decree on Promulgation of National Environmental Standards (2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017 EIB Standard 3	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
				EEE3		
	Exhaust emissions from the operation of construction machinery	No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the Engineer. Construction equipment will be maintained to a good standard and fitted with pollution control devices regularly monitored by the Contractor and Engineer. Stationary emission sources, if used (e.g., portable generators, compressors, etc.) shall be positioned as far as is practical from sensitive receptors. At a minimum generator should be more than 50m from receptors. Implementation Plans: • PPP	Compliance with national air quality standards	Decree on Promulgation of National Environmental Standards (2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017 EIB Standard 3 EEE3	Contractor to implement mitigation.	Part of general construction costs
	Fugitive emissions	Dust control measures will be implemented on the main construction zones and haul routes and to 500 m from the camp and plant entrances. The Contractor will be required to have an adequate supply of bowsers and carry out watering for dust control at least once every two hours in these locations: in dry weather with temperatures of over 25°C, or in windy weather. Avoid overwatering as this may make the surrounding muddy. The plan for watering will be adjusted based on areas identified during works as being significant dust areas. Vehicle movements will be restricted to defined	Compliance with national air quality standards	Decree on Promulgation of National Environmental Standards (2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		access routes and demarcated working areas (unless in the event of an emergency). A strict Project speed limit of 20km/hr. will be enforced for Project vehicles using unmade tracks and within Project construction zones. Vehicles carrying fine aggregate materials will be sheeted to help prevent dust blow and spillages. Earthwork operation will be suspended when the wind speed exceeds 20 km/h in areas. Rock crushing plant equipment will be fitted with water sprinklers that will run continuously while the plant is operational. Implementation Plans: • PPP		February 2017 EIB Standard 3 EEE3		
	VOCs	Hazardous materials stored and used on site with potential gas emissions (e.g., Volatile Organic Compounds) will be in well-ventilated, but secure low-risk areas, away from major transport routes and away from the site boundary (where possible). Volatile fuels and chemicals (including hazardous wastes) will be stored in sealed containers. On site storage of large quantities of volatile fuels will be avoided, equally prolonged exposure to direct sun and heat will be avoided. Fires and material burning will not be allowed on the Project site. Chemical storage areas will be purpose built and well maintained. A data log of all chemicals with MSDSs will be	Materials stored in adequate containers No accidents involving workers and community	Decree on Promulgation of National Environmental Standards (2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017 EIB Standard 3	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		provided at the storage facility within easy access. Implementation Plans: • PPP		EEE3		
Hydrology	Drainage and Flooding	During the construction phase the Contractor will be required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage to properties and land by flooding and silt washed down from the works. Arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations. Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractors will restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption. The Contractor will also be responsible for ensuring that no construction materials or construction waste block existing drainage channels within the Project corridor. The channels shall be kept open at all times to avoid disruption. Implementation Plans: • CESMP	Complaints from community.	Law on Water and Water Resources (2017) EIB Standard 3 EEE3	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Bridge works	Divert the water flow near the bridge piers. Provide coffer dams, silt fences, sediment barriers or other devices to prevent migration of silt during construction within streams. Perform dewatering and cleaning of cofferdams to prevent siltation by pumping from cofferdams to a settling basin or a containment unit. Carry out construction works without interrupting the traffic on the Project Road with the provision of suitable diversions. Ensure no waste materials are dumped in the river, including re-enforced concrete debris. Place generators more than 20 meters from the river. Ensure that no concrete sludge waste is dumped in the river. Carefully collect all polystyrene (from expansion joints) so that it does not litter the local environment. Ensure that no hazardous liquids are placed within 10 meters of the river. Provide portable toilets at bridge construction sites to prevent defecation by workers into the river. Ensure that workers are provided with correct PPE including harnesses. During piling works ensure that pumped water is filtered through a silt trap before being	Compliance with water quality standards. Correct PPE provided to workers	Decree on National Environment Standard dated 81/GV, dated 21 Feb. 2017 Decree on Promulgation of National Environmental Standards (2017) Law on Water and Water Resources (2017) EIB Standard 3 EEE3		Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		discharged to the river. Implementation Plans: • CESMP • PPP • Bridge Construction Plan				
	Ground and surface water pollution.	Implementation of the specific mitigation measures outlined under Construction Camps, below. Provide portable toilet facilities for workers at road work sites. Implementation Plans: • PPP	Portable toilets at work sites.	Decree on National Environment Standard dated 81/GV, dated 21 Feb. 2017 Decree on Promulgation of National Environmental Standards (2017) Law on Water and Water Resources (2017) EIB Standard 3 EEE3	Contractor to implement mitigation.	Part of general construction costs
	Water Supply	Only legally permitted water resources are used for technical water supply. Implementation Plans: • CESMP	Permits in place.	Law on Water and Water Resources (2017) EIB Standard 3	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
				EEE3		
	Camp Management	Wastewater arising on the site will be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a way that will cause neither pollution nor nuisance. There will be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies will be prohibited. Liquid material storage containment areas will not drain directly to surface water (including wetlands and ponds). Lubricating and fuel oil spills will be cleaned up immediately and spill clean-up materials will be maintained (including spill kits) across the Contractors construction camp and ancillary facilities, e.g., asphalt plant. Discharge of sediment-laden construction water directly into surface watercourses or wetlands will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge. Spill clean-up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: • Fueling operations will occur only within containment areas. • All fuel and chemical storage (if any) will	Compliance with project water quality standards. Spill kits at work sites. Records of spills and leaks.	Decree on National Environment Standard dated 81/GV, dated 21 Feb. 2017 Decree on Promulgation of National Environmental Standards (2017) Law on Water and Water Resources (2017) EIB Standard 3 EEE3	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tanks. • Filling and refueling will be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids. • All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. • The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any drain or watercourses. • Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited. • Should any accidental spills occur immediate cleanup will be undertaken and all cleanup materials stored in a secure area for disposal. Disposal of such will be undertaken by a waste management company contracted by the Contractor. The waste management company must have the required licenses to transport and dispose of hazardous waste before any such waste is removed from the site. The Contractor				

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		will keep copies of the company's licenses and provide waste transfer manifests at his camp site for routine inspection by the Engineer. Implementation Plans: • PPP • CCMP				
	River works	Consult with PONRES to establish the fish spawning periods and fish migration periods of special status species (including: *Cirrhinus cirrhosis* (VU), *Cyprinus carpio* (VU) – introduced non-native species, *Luciocyprinus striolatus* (EN), *Mystacoleucus lepturus* (VU), *Pseudohemiculter dispar* (VU) and *Wallago attu* (VU)) in relation to the bridge construction works to ensure that all works are undertaken in periods least likely to affect the fish spawning period. Implementation Plans: • BMP • Bridge Construction Plan	Records of meetings with PONRE	Environmental Protection Law (2012) Wildlife and Aquatic Law (2008) Law on Water and Water Resources (2017) EIB Standard 3 EIB Standard 4 EEE3	Contractor to implement mitigation	Part of general construction costs
Soils	Gas Stations	Physical site investigation should be done and if needed, soil sampling of the project road section to be excavated around gas stations. If analysis of samples shows elevated levels of contamination a plan will be prepared by the Contractor to dispose of any excavated materials in these areas as hazardous waste. The plan shall also include procedures for the safe		National Soil Quality Standards EIB Standard 3 EEE3	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		handling and transport of the material. Implementation Plans: • PPP				
	New Borrow Pits	Before the materials extraction the layer of top-soil (about 20 cm) will be removed to the side of excavation area and kept until the area works will be finalized. Top-soil stockpiles will be located at least 50 meters distance from any watercourses to avoid water siltation and obstruction. The height of stockpiles will not exceed three meters to avoid wind erosion and dust emissions. Provide an access road to the borrow site. All drivers will be instructed to use only this officially designated road. If the Engineer deems the site to be hazardous to the local community, he will request the Contractor to fence the site to prevent access and provide warning signs on the fencing. Due to the sensitivity of the borrow pit locations, borrow haul routes will follow established transport corridors/rights-of-way, to the extent that is practicable. Full site reinstatement will be undertaken by the Contractor to avoid landscape damage and habitat loss. Rehabilitation measures will include: • Removing of all types of equipment from the site;	Borrow pit management plan prepared. Full reinstatement of site per borrow pit plan.	Environmental Protection Law (2012) Wildlife and Aquatic Law (2008) Forestry Law (2021) ESS3 ESS6	Contractor to select borrow sites and apply for approval from PONRES and any other regulatory agencies.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		• Removing of all types of waste or/and polluted soil and materials if any exist; • Slope stabilization measure such as re-covering with topsoil, and further seeding, grassing and planting of appropriate bushes or/and trees if reasonable. • The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts. Additional borrow pits will not be opened without the restoration of those areas no longer in use. Implementation Plans: • Borrow Pit Management Plan				
	Contamination of Soils	All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tank (or one tank if more than one tank is located in the bund). The construction camp maintenance yard will be constructed on impervious hard standing with adequate drainage to collect spills, there will be no vehicle maintenance activities on	No leaks and spills onto bare soils.	Environmental Protection Law (2012) ESS3 ESS6	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		open ground. Filling and refueling will be strictly controlled and subject to formal procedures. Drip pans will be placed under all filling and fueling areas. Waste oils will be stored and disposed of by a licensed contractor. All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any soils. No bitumen drums or containers, full or used, will be stored on open ground. They will only be stored on impervious hard standing. Areas using bitumen will be constructed on impervious hard standing to prevent seepage of oils into the soils. No bitumen drums or containers, full or used, will be stored on open ground. They will only be stored on impervious hard standing. Areas using bitumen will be constructed on impervious hard standing to prevent seepage of oils into the soils. Implementation Plans: • PPP				

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Soil Erosion	Material that is less susceptible to erosion will be selected for placement around culverts. Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local flora; (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth. The Engineer and the Contractor will both be responsible for ensuring that embankments are monitored continuously during construction for signs of erosion. Implementation Plans: • CESMP	Revegetation of slopes completed No signs of significant erosion	EIB Standard 3 EEE3	Contractor to implement mitigation.	Part of general construction costs
	Topsoil	Locate topsoil stockpiles outside drainage lines and protect stockpiles from erosion; construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil; rip ground surface prior to the spreading of topsoil; and remove unwanted materials from topsoil such as roots of trees, rubble and waste etc. Confine operation of heavy equipment within the ROW, as much as possible, to avoid soil compaction and damage to privately owned land. If in case private lands are disturbed, the contractor should promptly inform the owner and agree on the ways to remedy the situation. Implementation Plans:	No works outside of RoW Complaints from community	EIB Standard 3 EEE3	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		• TSMP				
Geohazards	Forest fires	Training for staff in actions to take in the event of a forest fire, e.g., evacuation procedures and training relating to the prevention of fires at work sites. Implementation Plans: • ERP	Training records	EIB Standard 3 EEE3	Contractor to implement mitigation	Part of general construction costs
Waste Management	Recycling and re-use	Where possible, surplus materials will be reused or recycled. Used oil and grease will be removed from site and sold to an approved used oil recycling company. Implementation Plans: • WMRP	Waste disposal records	EIB Standard 3 EEE3 Environmental Protection Law (2012) Decision on the Management, Monitoring, and Inspection of the Treatment and Disposal of Contaminated and Hazardous Waste No. 3649/MONRE (2021)	Contractor to implement mitigation.	Part of general construction costs
	Spoil	Where spoil material is generated the Contractor will be responsible for preparing a method statement of the safe disposal of spoil material at approved locations.	Complaints from community Method statements	EIB Standard 3 EEE3 Environmental	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		No spoil shall be removed from site until method statement specify the disposal locations and approvals has been reviewed and approved by the Engineer. Under no circumstances will the Contractor dump excess materials on private lands. Excess spoil will not be dumped or pushed into any river at any location. Prompt removal of mounds of construction materials and debris when work on the section is finished. Implementation Plans: • WMRP • Method Statements	completed No pollution of surface water	Protection Law (2012)		
	Inert Solid & Liquid waste	Provide refuse containers at each worksite. Maintain all construction sites in a cleaner, tidy and safe condition. Waste storage containers will be covered, tip-proof, weatherproof and scavenger proof. Train and instruct all personnel in waste management practices and procedures. Collect and transport non-hazardous wastes to all approved disposal sites. Implementation Plans: • WRMP	Waste containers provided at camps and work zones. Training records Waste transfer papers	EIB Standard 3 EEE3 Environmental Protection Law (2012)	Contractor to implement mitigation and conduct training.	Part of general construction costs
	Concrete	Waste concrete will be crushed and re-used as	Records of waste	EIB Standard 3	Contractor to	Part of

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		fill material, or base material where possible. Under no circumstances should concrete mixers be washed out onto open ground at construction sites, such as bridges. The existing pavement will be scarified, and where the material meets the required specification, it will be compacted and re-used as sub-base material. Implementation Plans: • WRMP	reused No pollution of surface water	EEE3 Environmental Protection Law (2012)	implement any recommendations for re-use of asphalt. Contractor to implement mitigation.	general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Hazardous Waste	Storage of hazardous waste will be in specific secure locations as identified by the waste management plan. Hazardous liquids must be stored within impermeable bunds. Collect and temporarily store used hazardous waste separately in specialized containers and place in safe and fire-free areas with impermeable floors roofs, at a safe distance from fire sources and according to the requirements of their MSDS. Training and suitable PPE will be provided to all personnel handling hazardous waste. Disposal of waste materials will be properly undertaken in-line with national regulatory requirements. Keep records of the types and volumes of waste removed from the site on a weekly basis. Implementation Plans: • WMRP	Waste containers provided at camps and work zones. Training records Waste transfer papers	EIB Standard 3 EEE3 Environmental Protection Law (2012) Decision on the Management, Monitoring, and Inspection of the Treatment and Disposal of Contaminated and Hazardous Waste No. 3649/MONRE (2021)	Contractor to implement mitigation.	Part of general construction costs
Construction Camps and Plant	Camp site pollution	Rain-water run-off arising on the site will be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The drainage system will be fitted with oil and grease interceptors. There will be no direct discharge of sanitary or wash water to surface water.	Drainage installed at site No pollution of surface water Septic tanks constructed Waste transfer papers	Environmental Protection Law (2012) EIB Standard 3 EEE3	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		In the absence of functioning sewerage and sewage treatment facilities it is recommended that the Contractor provides his own on-site wastewater treatment facilities. For sites servicing a small number of employees (less than 150), septic tanks may be used. For larger sites, liquid wastes will as a minimum receive primary treatment in anaerobic tank or pond preceded by a bar screen to remove large solid objects (e.g., sticks, rags). Primary treatment (also referred to as clarification, sedimentation or settling) is the process where wastewater is allowed to settle for a period (around 2 hours) in a settling tank. This leads to separation of a liquid effluent which includes oils and grease and a liquid-solid sludge. Primary treatment leads to reduction in suspended solids, biological oxygen demand and removal of floating material (e.g., feces). There will be no direct discharge of untreated sanitary or oily wastewater to surface water bodies. Licensed contractors will be required to collect and disposal of liquid waste from the septic tanks on regular basis. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies will be prohibited. Liquid material storage containment areas will not drain directly to surface water. Wastewater from vehicle washing bays will be free of pollutants if the wash bay has been constructed correctly. Lubricating and fuel oil spills will be cleaned up	Spill kits in place			

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		immediately and spill cleanup materials will be maintained at the storage area. Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters and are connected to septic tanks, or wastewater treatment facilities. Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge. Washing out concrete trucks at construction sites will be prohibited unless specific concrete washout areas are provided for this purpose at the construction site. The washouts will be impermeable and emptied when 75% full. Spill cleanup equipment will be maintained on site (including at the site maintenance yard and vehicle fueling areas). The following conditions to avoid adverse impacts due to improper fuel and chemical storage: • Fueling operations will occur only within containment areas. • All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tanks. • Filling and refueling will be strictly				

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids. • All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. • The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any drain or watercourses. • Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited. • Should any accidental spills occur immediate cleanup will be undertaken, and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste. Implementation Plans: • PPP • CCMP				
	Camp site decommissioning	Maintain and cleanup campsites and respect the rights of local landowners. If located outside the RoW, written agreements with local landowners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within a predetermined period.	Records of agreements with landowners	Environmental Protection Law (2012) EIB Standard 3 EEE3	Contractor to implement mitigation	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Pollution and Emissions from Concrete Batching Plants	To limit impacts from dust, the following conditions will apply: • Batching plants will be located downwind of urban areas. • The entire batching area traversed by vehicles – including driveways leading into and out of the area – will be paved with a hard, impervious material. • Sand and aggregates will be delivered in a dampened state, using covered trucks. If the materials have dried out during transit they will be re-wetted before being dumped into the storage bunker. • Sand and aggregates will be stored in a hopper or bunker which shields the materials from winds. The bunker should enclose the stockpile on three sides. The walls should extend one meter above the height of the maximum quantity of raw material kept on site and extend two meters beyond the front of the stockpile. • The hopper or bunker will be fitted with water sprays which keep the stored material damp at all times. Monitor the water content of the stockpile to ensure it is maintained in a damp condition. • Overhead storage bins will be totally enclosed. The swivel chute area and transfer point from the conveyor will also	Compliance with national air quality and water quality standards Complaints from community	Environmental Protection Law (2012) EIB Standard 3 EEE3 Decree on Promulgation of National Environmental Standards (2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017 Law on Water and Water Resources (2017)	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		be enclosed. • Rubber curtain seals may be needed to protect the opening of the overhead bin from winds. • Conveyor belts which are exposed to the wind and used for raw material transfer will be effectively enclosed, to ensure dust is not blown off the conveyor during transit. Conveyor transfer points and hopper discharge areas will be fully enclosed. • Conveyor belts will be fitted with belt cleaners on the return side of the belt. • Weigh hoppers at front end loader plants will be roofed and have weigh hoppers shrouded on three sides, to protect the contents from the wind. The raw materials transferred by the front-end loader should be damp, as they are taken from a dampened stockpile. • Store cement in sealed, dust-tight storage silos. All hatches, inspection points and duct work will be dust tight. • Cement dust emissions from the silo during filling operations must be minimized. The minimum acceptable performance is obtained using a fabric filter dust collector. • Totally enclose the cement weigh hopper, to ensure that dust cannot escape to the atmosphere. • An inspection of all dust control components will be performed routinely –				

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		for example, at least weekly. • All contaminated storm water and process wastewater will be collected and retained on site. • All sources of wastewater will be paved and bunded. The specific areas that will be paved and bunded include; the agitator washout area, the truck washing area, the concrete batching area, and any other area that may generate storm water contaminated with cement dust or residues. Contaminated storm water and process wastewater will be captured and recycled by a system with the following specifications: • The system's storage capacity must be sufficient to store the runoff from the bunded areas generated by 20 mm of rain. • Water captured by the bunds will be diverted to a collection pit and then pumped to a storage tank for recycling. • An outlet (overflow drain) in the bund, one meter upstream of the collection pit, will divert excess rainwater from the bunded area when the pit fills due to heavy rain (more than 20 mm of rain over 24 hours). • Collection pits should contain a sloping sludge interceptor, to separate water and sediments. The sloping surface enables easy removal of sludge and sediments. • Wastewater will be pumped from the collection pit to a recycling tank. The pit				

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		will have a primary pump triggered by a float switch and a backup pump which automatically activates if the primary fails. • Wastewater stored in the recycling tank needs to be reused at the earliest possible opportunity. Implementation Plans: • PPP • CCMP				
	Asphalt Plant	Emissions & Noise: • Asphalt plants will be located downwind of residential areas and not within 100m of any residential area. • Adequate Personal Protective Equipment (PPE) will be provided to staff working in areas of high noise and emissions. Storage and Use of Hazardous Materials (including bitumen): • Ensure all hazardous materials are stored (including within suitable sized bunds for liquids), handled and disposed of according to their Material Safety Data Sheet (MSDS). • Copies of MSDS will be kept on site with all hazardous materials. • The Contractor will keep a plan of site indicating where all hazardous materials are stored.	Compliance with national air quality, noise and water quality standards Complaints from community PPE in place MSDS available First aid kits at site	Environmental Protection Law (2012) EIB Standard 3 EEE3 Decree on Promulgation of National Environmental Standards (2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017 Law on Water	Contractor to implement mitigation	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		Vehicle Movement: • The Contractor will include the asphalt plant in his Traffic Management Plan, including haul routes from the plant. Health and Safety: • To prevent bitumen burns it will be compulsory for the workers handling hot bitumen to wear full-body protection. • All transportation, handling and storage of bitumen will be handled safely by experienced personnel. • The dust from the manufacturing process may pose respiratory hazards, hence protective air mask will be provided to the operators for the loading and unloading of aggregates. • Hearing protectors will be provided those working on the plant. • First Aid kits (compliant with OSHA standard 1910.266 App. A) will be available on site for the workers in case of emergency. The MSDS for each chemical product will be made accessible onsite and displayed. If the Contractor chooses to use existing asphalt and concrete batching facilities the following conditions shall apply: The Contractor shall undertake an initial environmental and social audit of the facility to ensure that:		and Water Resources (2017)		

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		• The facility has a license to operate in the location. • Air emissions and noise are not impacting upon sensitive receptors • Waste materials are being managed appropriately • Wastewater discharge is adequately controlled, and no contaminated water is being discharged from the site. • All staff are wearing appropriate PPE. The results of the audit will be submitted to the CSC for review before any site is used. The audit shall be repeated on a six-monthly basis. Implementation Plans: • OHS Plan • PPP				
Noise and Vibration	Construction Noise	All exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken. Stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible. No rock crushing plants, or any long-term generators of significant noise will be allowed that are located within 500 meters of sensitive receptors or urban areas.	Compliance with project noise standards Complaints from community	Environmental Protection Law (2012) EIB Standard 3 EEE3	Contractor to implement mitigation	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		Operations will be scheduled to coincide with periods when people would least likely be affected; work hours and workdays will be limited to less noise-sensitive times. Hours-of-work will be approved by the Engineer having due regard for possible noise disturbance to the residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential areas, medical facilities, educational facilities, and religious temples the Contractor's hours of working will be limited to 8 AM to 6 PM. During religious holidays the Contractor will not work within 250 meters of any temple. Public notification of construction operations will incorporate noise considerations. Implementation Plans: • PPP				
	Vibration	Where the results of the vibration monitoring show that the specified construction vibration limit is reached at a particular location, the Contractor shall suspend the construction activities that generate the excessive vibration at such location, notify the Engineer and with the approval of the Engineer take mitigative actions necessary to keep the construction vibration within the specified limit. This may, for example include: • The use of low roller vibration settings and performing compaction without vibration.	Continuous monitoring at sensitive sites Compliance with project vibration standards Complaints from community	EIB Standard 3 EEE3 DIN 4150-3, Structural Vibration, Part 3: Effect of vibration on structures	Contractor to implement mitigation	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		• The use of low vibration piling techniques. • Provide temporary vibration barriers in sensitive locations. Implementation Plans: • CVMP				
Standard 9: Health, Safety and Security **ESS4: Community Health and Safety**						
Community Health and Safety	Road closures, diversions and blocking of access routes	Provision of all road diversion signs and ensure that diversion roads do not impact negatively upon private lands. Any diversions will be agreed upon by the Engineer. All access routes will be kept open during Project works for at least 50% of the day during construction works and 100% of the time after construction works are completed for the day. Implementation Plans: • CHSP • TMP	Diversions in place and agreed with community Complaints from the community	EIB Standard 9 ESS4 National road safety standards	Contractor to implement mitigation.	Part of general construction costs
	Access	Provide safe access at all times through the construction site to people whose residences/shelters and routes are temporarily severed by road construction.	Complaints from the community	EIB Standard 9 ESS4 National road safety standards	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Traffic safety	Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions. Allow for adequate traffic flow around construction areas. The signs should be visible day and night and sufficiently installed. Given that there is no by-pass road, installation of suitable physical demarcation between working areas and the carriageway open to traffic is a must. Provide for road safety campaigns and enforcement of road safety regulations. Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control. Access roads for borrow pits, batching plants, etc., should be maintained during the construction phase and rehabilitated at the end of construction. Implementation Plans: • CHSP • TMP	Records of consultations / outreach No accidents at worksites Safety campaign materials and records of meetings Complaints from the community	EIB Standard 9 ESS4 National road safety standards	Contractor to implement mitigation.	Part of general construction costs
	Educational Facilities	Place warning signs outside of each school to alert construction vehicles of their locations and to be aware of children crossing the road in these areas. At least two weeks before construction starts within the vicinity of all schools, the Contractor will be responsible for informing the School of the works program and schedule so that the	Warning signs installed Records of meetings with schools Protective barriers in place No work outside schools during	EIB Standard 9 ESS4 National road safety standards	Contractor to implement mitigation. Contractor to provide letters to schools to Engineer to confirm that the schools have been informed of	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		school can inform pupils of the impending works and to be vigilant throughout the construction program. If warranted, the Engineer may recommend that the Contractor places protective barriers in-front of school entrances to prevent children rushing out from the school gates into the path of construction vehicles or works. When working in the immediate vicinity of a school, the Contractor will cease works for at least 30 minutes before school starts and after it closes to allow children to leave the area safely and to allow parents safe access to collect their children. Implementation Plans: • CHSP • TMP	specified periods		impending works.	
	Child Labour	The Contractor will ensure that no persons under the age of 18 are employed on the Project. Implementation Plans: • LMP	Staff contracts	EIB Standard 9 ESS4	Contractor to implement mitigation	N/A
	Labour Influx	Managed according to the requirements of the LMP. Implementation Plans: • LMP	Per LMP	EIB Standard 9 ESS4	Contractor to implement mitigation	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
Infrastructure	Electrical Systems and water pipes	During construction all power lines (transmission and distribution) and water pipes in the Project Corridor will be kept operational, this will include temporary transmission lines while existing poles and lines are moved. If any temporary disruption to water or power supplies caused by construction activities is absolutely necessary the Contractor must warn the affected population and receive approval from the Engineer for the disruption at least 24 hours in advance and no disruption will last longer than 4 hours. Implementation Plans: • CESMP	Complaints from community Records of information disclosure	EIB Standard 9 ESS4	Contractor to implement mitigation.	Part of general construction costs
	Traffic Management	Submit a Traffic Management Plan to local traffic authorities and the Engineer prior to mobilization and include the plan as part of his CESMP. Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions. Allow for adequate traffic flow around construction areas. Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control. Provide temporary access where accessibility is temporarily restricted due to civil works. Ensure that access routes, via diversions, always remain open to businesses, residential	Records of information disclosure to the public No accidents at work sites	ESS4 National road safety standards	Contractor to implement mitigation	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		properties, schools, medical facilities, the airport, etc. Implementation Plans: • TMP • CHSP				
Standard 6: Involuntary Resettlement **ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement**						
Land Use	Accessibility	The Contractor must prepare dedicated temporary pathways to all businesses that might otherwise be cut off from the road during the construction phase. The pathways must be wide enough to allow access to the business and must be kept free of mud and construction debris and should not be liable to flooding. Implementation Plans: • RAP • TMP	Complaints from community	EIB Standard 6 Decree #84 on Compensation and Resettlement of People Affected by Development Projects (2016) Technical Guidelines on Compensation and Resettlement of People Affected By Development Project (2005) ESS5	Contractor to implement mitigation.	Part of general construction costs
Standard 4: Biodiversity and Ecosystems						

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources						
Designated Sites	Poaching and encroachment	Regular worker training sessions and toolbox sessions for all workers on NR2E relating to Phou HiPhi NPA Routine inspections of work sites along Pho HiPhi to ensure that machinery and workers are not on the other side of the river or dumping waste materials in this area. Implementation of a strict code of conduct with regards to treatment of local fauna which will include a prohibition of poaching which will be a sackable offence. Workers are to be clearly informed the environmental rules of conduct, along with the penalties for non-compliance, to be prohibited from buying/selling, eating of wildlife, and burning of natural vegetation, anywhere in or near the project area. Project staff and contractors will be banned from hunting, fishing, buying and collecting natural resources (e.g., wildlife, aquatic animals, fish) within the project area including rivers to minimize impacts to fauna and their habitats. Implementation Plans: • BMP	Training records Records of inspections completed No wildlife consumed at camps or worksites	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (20**21**) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement mitigation.	Part of general construction costs
	General measures	Ensure compliance with Project BMP Implementation Plans: • BMP	Per BMP	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law	Contractor to implement mitigation	See BMP for any specific costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
				(2021) United Nations Convention on Biodiversity (CBD 1996 ESS6		
Flora and Fauna	Vegetation clearance	No chemicals will be used to clear vegetation. Implementation Plans: • BMP	No chemicals at work sites.	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (2021) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement mitigation.	No Cost
	Natural Habitat & Threatened species	An ecologist will be on hand to supervise the habitat (tree and bushes) clearance works and provide advice to the workforce. Vegetation located on the steep slopes of mountains within the project area will also be preserved where possible to minimize the risk of erosion. Storage areas will be located in areas away from natural forest, headstreams and drainage. Controls of forest/bushfire including a Project ban on open-burning of waste.	Ecologist at site during land clearing activities. Written records of inspections	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (2021) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement mitigation	See BMP for any specific costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		Implementation Plans: • BMP				
	Noise and Vibration	Project construction will not be undertaken at dusk, dawn and at night to avoid disturbance to nocturnal and crepuscular fauna (i.e., bats, herpes) from increased noise and vibration. Implementation Plans: • BMP	Timing of construction works at sensitive sites (e.g. close to Phou Hiphi)	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (20**21**) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement mitigation	None
	Poaching	Project staff and contractors will be banned from hunting, fishing, buying and collecting natural resources (e.g., wildlife, aquatic animals, fish) within the project area including rivers to minimize impacts to fauna and their habitats. Workers are to be clearly informed the environmental rules of conduct, along with the penalties for non-compliance, to be prohibited from buying/selling, eating of wildlife, and burning of natural vegetation, anywhere in or near the project area. Implementation Plans: • BMP	No wildlife consumed at camps or worksites	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (20**21**) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement mitigation	None

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Invasive species	A washdown procedure will be employed to prevent invasive weed spread and potential contamination of the project area from the receiving environment. Non-invasive local plant species will only be used for revegetation Best practice organic waste management procedures will be followed to avoid attracting pests. Implementation Plans: • BMP	Washdown procedure in place Records of species used for revegetation.	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (2021) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement mitigation	See BMP for any specific costs
	Tree planting	A planting scheme should be developed and implemented by the Project or the contractor in consultation with Project Management Unit (including Provincial/district Public Work and Transportation Division (PWT). A number of trees and bushes will be planted along the sidewalks of the proposed road from the beginning to the end of the road alignment. The species of trees to be planted should be native tree species of local provenance including rare and threatened species. The geocells geotextile along the escarpments and embankments will be seeded with grasses and herbs using native species of local provenance including nationally rare and threatened species. Implementation Plans: • BMP	Planting scheme in place Records of tree species planted	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (2021) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement mitigation	See BMP for any specific costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Standard 7: Vulnerable Groups, Indigenous People and Gender[5] **ESS7: Indigenous Peoples**					
Indigenous People	Participation and inclusion	Participation of ethnic groups in monitoring the implementation of EGEP, Environment and Social Management Plan and Resettlement Action Plan. Implementation Plans: • EGEP	Records of participation in meetings	EIB Standard 7 ESS7 Guideline on Consultation with Ethnic Groups (2013)	Contractor and MPWT to follow requirements of EGEP	None
	The construction will create more dust, noise, dirt and traffic disruption	These issues have been addressed and mitigation measure has been defined in the ESIA and ESMP. Implementation Plans: • ESIA • ESMP	See mitigation of air, noise and dust above	EIB Standard 7 ESS7	Contractor to implement mitigation.	Part of general construction costs
	The influx of construction workers may create violence against the ethnic women and children	These issues have been addressed and mitigation measure has been defined in the ESIA and ESMP. Implementation Plans: • ESIA • ESMP	See mitigation for worker influx above	EIB Standard 7 ESS7	Contractor to implement mitigation.	Part of general construction costs

[5] This section includes extracts directly from project EGEP

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	There has been avoidance of impacts by taking a Fence-to-Fence approach and there is no demolition, loss of stores, etc. Minor impacts still remain as fences, kitchens and other small structures.	The detail information of affected structures has been included in the results of the survey inventory of loss, the mitigation measure and compensation procedures included in the RAP. Implementation Plans: • RAP	Per RAP	EIB Standard 7 EIB Standard 6 ESS7	MPWT to implement RAP	See RAP
	Accident, insufficient warning sign and road safety management plan may lead to road accident. Accidents and/or incidents would occur at construction sites such as fall in holes, smash into stockpile of dirt or soil/gravel, house	These issues have been addressed and mitigation measure has been defined in the ESIA and ESMP. Implementation Plans: • ESIA • ESMP	See indicators specified above under community health and safety	EIB Standard 7 ESS7	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	inaccessibility, etc. Accidents or incidents often occur during construction. Warning and restrictive signs should be installed where applicable. Traffic conditions may be more difficult during construction.					
	Unclear demarcation of the affected area	The detail information of affected structures has been included in the results of the survey inventory of loss, the mitigation measure and compensation procedures included in the RAP. Implementation Plans: • RAP	Per RAP	EIB Standard 7 EIB Standard 6 ESS7	MPWT to implement RAP	See RAP
	Access into/out from the villages is difficult during the construction. Road condition	These issues have been addressed and mitigation measure has been defined in the ESIA and ESMP. Implementation Plans: • ESIA	See indicators above for access to properties	EIB Standard 7 ESS7	Contractor to implement mitigation.	Part of general construction costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	needs to be upgrade for the entrance-exit road of the community and small road within the affected communities.	• ESMP				
	The construction phase should finish in a short timeframe or as soon as possible. If the construction is delay it will be affected local business, safety and local communities.	These issues have been addressed and mitigation measures have been defined in the RAP & EGEP Implementation Plans: • RAP • EGEP	Per RAP & EGEP	EIB Standard 7 EIB Standard 6 ESS7	MPWT to implement RAP & EGEP	See RAP

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
	Unclear information about the detailed information of project activities, beneficiaries, impacts in each road section.	The detail information of affected structure has been included in the results of the survey inventory of loss, the mitigation measure and compensation procedures included in the RAP, EGEP and ESIA. Implementation Plans: • RAP • EGEP • ESIA	Per RAP	EIB Standard 7 EIB Standard 6 ESS7	MPWT to implement RAP	See RAP
Standard 10: Cultural Heritage **ESS8: Cultural Heritage**						
Cultural Heritage	Impacts to Historical and archeological areas	In the event of any chance finds during the construction works procedures will apply that are governed by GoL legislation and guidelines and as outlined in the Contractors Chance Find Procedure. Implementation Plans: • Chance Find Procedure	Records of chance finds	EIB Standard 10 Law on National Heritage (2014) Decree on the Preservation of Cultural, Historical and Natural Heritage (1997) ESS8	Contractor to implement mitigation.	Part of general construction costs
	Religious Holidays	During religious holidays the Contractor will not work within 250 meters of any temple. Implementation Plans:	Complaints from community No works in the areas during religious	EIB Standard 10 Law on National	Contractor to implement mitigation.	

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
		• CESMP	holidays	Heritage (2014) Decree on the Preservation of Cultural, Historical and Natural Heritage (1997) ESS8		
Standard 2: Stakeholder Engagement **ESS10: Stakeholder Engagement and Information Disclosure**						
Stakeholder Engagement	Communication with stakeholders	Contractor will provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions through a rolling program of community meetings along the Project corridor as work progresses. The Contractor will also hold monthly community meetings in each village / town where construction works are on-going. Implementation Plans: • SEP • EGEP	Records of information dissemination to the public Records of monthly meetings	Public Involvement Guideline (2012) EIB Standard 2 ESS10	Contractor to implement mitigation	Part of general Project costs.
Greivances	Grievances from stakeholders and workers	Monitor and report on grievances per the GRM Implementation Plans: • GRM	Grievances recorded	Law on Handling of Petitions (2015) EIB Standard 2	Contractor to implement mitigation	Part of general Project costs.

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plans	Indicators	Standards	Responsibilities	Cost
				ESS10		
Disclosure	Monitoring reports	Disclose monitoring reports. Implementation Plans: • ESIA • Contract Documents	Monitoring reports prepared	EIB Standard 2 ESS10	MPWT to disclose reports	Part of general Project costs.

Table 20: Environmental and Social Management Plan – Operational & Maintenance Phase

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
Standard 8: Labour Rights **Standard 9: Health, Safety and Security** **ESS2: Labor and Working Conditions**						
Economy and Employment	Use of local labour	As part of the maintenance of the road the Contractor should also look into the possibility of employing the local people for the maintenance of roadside drains upon completion of rehabilitation works. Implementation Plans: • CESMP	Number of locals employed.	EIB Standard 8 ESS2	Contractor to implement mitigation	Part of general Project costs
Workers' Rights and Occupational Health and	HIV / AIDS	Subcontract with a Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community. Repeat the HIV Awareness Program at intervals	Records of awareness sessions.	EIB Standard 8 ESS2	Contractor to implement mitigation	10,000 USD

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
Safety (OHS)		not exceeding four months. Implementation Plans: • CESMP • OHS Plan				
	Worker Health & safety	Safety Meetings conducted on a monthly basis. Incident and accident reporting. Regularly inspect, test and maintain all safety equipment. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, will be repaired or replaced immediately. All plant and equipment used on or around the Site will be fitted with appropriate safety devices. A fully equipped first aid base will be provided. Workers will be provided (before they commence works) with of appropriate PPE suitable for electrical work such as safety boots, helmets, gloves, protective clothes, goggles, and ear protection at no cost to the workers. Implementation Plans: • CESMP • OHS Plan	Documentation of meetings. Incident reports. Maintenance manuals	EIB Standard 8 Labour Law (2013) Decree on Occupational Safety and Health (2019) ESS2	Contractor to implement mitigation	Part of general Project costs
	Sub-contractor H&S	All sub-contractors will be supplied with copies of the CESMP. Provisions to be incorporated into all sub-	Contract documents include condition to apply CESMP.	EIB Standard 8 Labour Law (2013)	Contractor to implement mitigation	Part of general Project

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		contracts to ensure the compliance with the CESMP. All sub-contractors will be required to appoint a safety representative who will be available on the Site. Implementation Plans: • CESMP	Safety representatives at site.	Decree on Occupational Safety and Health (2019) ESS2		costs
	Pesticides	Use of pesticides for vegetation control is prohibited. Implementation Plans: • CESMP	No pesticide use.	EIB Standard 8 ESS2	Contractor to implement mitigation	Part of general Project costs
	COVID	The Contractor shall follow the national regulations and guidelines relating to COVID-19. Implementation Plans: • CESMP	COVID procedures in place as part of OHS plan.	EIB Standard 8 EIB Standard 9 ESS2 National Covid regulations	Contractor to implement mitigation	Part of general Project costs
Standard 3: Resource Efficiency and Pollution Prevention **ESS3: Resource Efficiency and Pollution Prevention and Management**						
Air Quality	Exhaust emissions from the operation of machinery Fugitive emissions	No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the Engineer. Equipment will be maintained to a good standard and fitted with pollution control devices regularly monitored by the Contractor	No complaints from community regarding air quality. Non-compliances reported by Engineer	EIB Standard 3 Decree on Promulgation of National Environmental Standards	Contractor to implement mitigation	Part of general Project costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		and Engineer. All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins. Implementation Plans: • CESMP		(2017) General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017 ESS3		
Climate Change	Additional impacts to project infrastructure	Monitoring of the mitigation measures during operation to determine their adequacy and if adaptive management measures are required. Implementation Plans: • OPBRC Contract	Damage to infrastructure from flooding.	EIB Standard 3 Decree on Climate Change (2019) United Nations Framework Convention on Climate Change (UNFCCC 1995). ESS3	Contractor to implement mitigation	Part of general Project costs
		Adequate and routine maintenance of the drainage system as a part of contractor's responsibilities under the OPBRC contract. Implementation Plans: • OPBRC Contract	Damage to infrastructure from flooding. Complaints from the community.	EIB Standard 3 Decree on Climate Change (2019) United Nations Framework Convention on	Contractor to implement mitigation	Part of general Project costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
				Climate Change (UNFCCC 1995). ESS3		
Hydrology	Drainage and Flooding	Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractors will restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption. The channels shall be kept open at all times to avoid disruption. Implementation Plans: • CESMP	Complaints from the community.	EIB Standard 3 ESS3	Contractor to implement mitigation	Part of general Project costs
	Water Supply	Only legally permitted water resources are used for technical water supply. Implementation Plans: • CESMP	Permits in place.	EIB Standard 3 Law on Water and Water Resources (2017)	Contractor to implement mitigation	Part of general Project costs
Soils	Contamination of Soils	Filling and refueling will be strictly controlled and subject to formal procedures. Drip pans will be placed under all filling and fueling areas. Waste oils will be stored and disposed of by a licensed contractor. All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.	Spills and leaks of fuel to soil.	EIB Standard 3 Environmental Protection Law (2012) Decree on Promulgation of National Environmental	Contractor to implement mitigation	Part of general Project costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any soils. No bitumen drums or containers, full or used, will be stored on open ground. They will only be stored on impervious hard standing. Areas using bitumen will be constructed on impervious hard standing to prevent seepage of oils into the soils. No bitumen drums or containers, full or used, will be stored on open ground. They will only be stored on impervious hard standing.		Standards (2017) National soil quality standards ESS3		
	Soil Erosion	Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local flora; (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth. Implementation Plans: • CESMP	Soil erosion on slopes.	EIB Standard 3 Environmental Protection Law (2012) ESS3	Contractor to implement mitigation	
Geohazards	Earthquakes	Routine inspection of structures after earthquakes by MPWT. Implementation Plans: • CESMP	Damage reports.	EIB Standard 3 National building codes ESS3	Contractor to implement mitigation	Part of general Project costs
Waste Management	Recycling and re-use	Where possible, surplus materials will be reused or recycled. Used oil and grease will be removed from site	Records of waste recycling and disposal.	EIB Standard 3 Environmental Protection Law	Contractor to implement mitigation	Part of general Project

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		and sold to an approved used oil recycling company. Implementation Plans: • WMRP		(2012) ESS3		costs
	Spoil	Under no circumstances will the Contractor dump excess materials on private lands. Excess spoil will not be dumped or pushed into any river at any location. Implementation Plans: • WMRP	Complaints from the community.	EIB Standard 3 Environmental Protection Law (2012) ESS3	Contractor to implement mitigation	Part of general Project costs
	Inert Solid & Liquid waste	Provide refuse containers at each worksite. Maintain all work sites in a cleaner, tidy and safe condition. Waste storage containers will be covered, tip-proof, weatherproof and scavenger proof. Train and instruct all personnel in waste management practices and procedures. Collect and transport non-hazardous wastes to all approved disposal sites. Implementation Plans: • WMRP	Complaints from the community. Waste management contracts in place.	EIB Standard 3 Environmental Protection Law (2012) ESS3	Contractor to implement mitigation	Part of general Project costs
	Hazardous Waste	Storage of hazardous waste will be in specific secure locations as identified by the waste management plan. Hazardous liquids must be stored within	Complaints from the community. Records of waste	EIB Standard 3 Environmental Protection Law	Contractor to implement mitigation	Part of general Project costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		impermeable bunds. Collect and temporarily store used hazardous waste separately in specialized containers and place in safe and fire-free areas with impermeable floors roofs, at a safe distance from fire sources and according to the requirements of their MSDS. Training and suitable PPE will be provided to all personnel handling hazardous waste. Disposal of waste materials will be properly undertaken in-line with national regulatory requirements. Keep records of the types and volumes of waste removed from the site on a weekly basis. Implementation Plans: • WMRP	recycling and disposal. Waste management contracts in place.	(2012) ESS3 Decision on the Management, Monitoring, and Inspection of the Treatment and Disposal of Contaminated and Hazardous Waste No. 3649/MONRE (2021)		
Noise and Vibration	Elevated noise	Adaptive noise management measures as required during operational phase. Implementation Plans: • CESMP	To be determined.	EIB Standard 3 ESS3 National Ambient Noise Standards	MPWT to complete adaptive measures, if necessary	TBD
Standard 9: Health, Safety and Security **ESS4: Community Health and Safety**						
Community Health and Safety	Public safety	Implement a program of public education and communication on road safety, targeting motorists and pedestrians throughout project	Program materials disseminated. Number of	EIB Standard 9 ESS4 Community	MPWT to complete safety program	MPWT costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		implementation. Implementation Plans: • CESMP	participants.	Health and Safety Plan		
	Road closures, diversions and blocking of access routes	Provision of all road diversion signs and ensure that diversion roads do not impact negatively upon private lands. All access routes will be kept open during Project works for at least 50% of the day during works and 100% of the time after works are completed for the day. Implementation Plans: • TMP	Complaints from the community.	EIB Standard 9 ESS4 ESS5	Contractor to implement mitigation	Part of general Project costs
	Access	Provide safe access at all times through the work site to people whose residences/shelters and routes are temporarily severed by activities. Implementation Plans: • CESMP	Complaints from the community. Accidents.	EIB Standard 9 ESS4	Contractor to implement mitigation	Part of general Project costs
	Traffic safety	Provide information to the public about the scope and schedule of activities and expected disruptions and access restrictions. Allow for adequate traffic flow around work sites. Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control. Implementation Plans:	Complaints from the community. Accidents.	EIB Standard 9 ESS4	Contractor to implement mitigation	Part of general Project costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		• TMP				
	Child Labour	The Contractor will ensure that no persons under the age of 18 are employed on the Project. Implementation Plans: • OPBRC Contract	Contract documents	EIB Standard 9 Labour Law (2013) ESS2	Contractor to implement mitigation	N/A
	Noise	All exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken. Stationary equipment will be placed as far from sensitive land uses as practical and provided with shielding mechanisms where possible. Work near Sensitive Receptors will be limited to short term activities. Work activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Contractor's hours of working will be limited to 8 AM to 6 PM. Implementation Plans: • CESMP	Complaints from the community.	EIB Standard 9 National Decree on Promulgation of National Environmental Standards (2017)	Contractor to implement mitigation	Part of general Project costs
	Human Trafficking	Comprehensive outreach in raising awareness on human trafficking to the ethnic women and	Program materials disseminated.	EIB Standard 9	MPWT / PTI to provide awareness	N/A

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		children in the project area using the information education communication materials already developed for anti-human trafficking by different projects. Contractor Code of Conduct need to be made aware to local people and participatory monitoring by local people shall be encouraged. Implementation Plans: • CESMP	Number of ethnic women and children participants.	ESS4 Anti-trafficking Law (2015)	training Contractor to disseminate code of conduct	
		Continue to increase efforts to disseminate, implement, and train police and border officials on the national victim protection and referral guidelines. Implementation Plans: • None	N/A	EIB Standard 9 ESS4 Anti-trafficking Law (2015)	GoL	N/A
Infrastructure	Electrical Systems and water pipes	If any temporary disruption to water or power supplies caused by work activities is absolutely necessary the Contractor must warn the affected population at least 24 hours in advance and no disruption will last longer than 4 hours. Implementation Plans: • CESMP	Complaints from the community. Evidence of warnings.	EIB Standard 9 ESS4	Contractor to implement mitigation	Part of general Project costs
	Road works	Apply provisions of TMP to maintenance activities. Implementation Plans: • TMP	Complaints from the community. Accidents.	EIB Standard 9 ESS4 National road safety standards	Contractor to implement mitigation	Part of general Project costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
Standard 6: Involuntary Resettlement **ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement**						
Land Use	Livelihoods impacts	Monitoring of livelihoods restoration per the RAP Implementation Plans: • RAP	Per RAP	EIB Standard 6 Decree #84 on Compensation and Resettlement of People Affected by Development Projects (2016) Technical Guidelines on Compensation and Resettlement of People Affected By Development Project (2005) ESS5	MPWT to monitor livelihood restoration	Per RAP
Standard 4: Biodiversity and Ecosystems **ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources**						
Flora and Fauna	Vegetation clearance	No chemicals will be used to clear vegetation. Implementation Plans: • CESMP	Manual / mechanical clearing of vegetation	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law	Contractor to implement mitigation	Part of general Project costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
				(2021) United Nations Convention on Biodiversity (CBD 1996 ESS6		
	Waste	Routine collection of garbage along the roadway, specifically in areas close to rivers and NPA. Implementation Plans: • WRMP	Records of routine waste collection.	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (2019) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement mitigation	Part of general Project costs
	General	Continue to apply pollution prevention measures as applied during the construction phase for maintenance activities. Implementation Plans: • PPP	Per construction phase indicators.	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (2019) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement mitigation	Part of general Project costs

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
Designated Sites	Poaching	Prohibit hunting and natural resource collecting by the road maintenance personnel and contractors when at work. To be communicated through induction and training to all personnel (employees and contractors). Implementation Plans: • BMP	Records of awareness sessions.	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (2019) United Nations Convention on Biodiversity (CBD 1996 ESS6	Contractor to implement mitigation	Part of general Project costs
	NPA Protection	A program to strengthen the management of Pho HiPhi is required in the longer term and reduce the current a potential future degradation of the site. However, such a program is beyond the scope of this Project and should be part of a provincial government and MoNRE effort to provide better management of the NPA. Implementation Plans: • CESMP	N/A	EIB Standard 4 Wildlife and Aquatic Law (2008) Forestry Law (2019) United Nations Convention on Biodiversity (CBD 1996 ESS6	Provincial government and MoNRE to develop and implement program.	N/A
Standard 10: Cultural Heritage **ESS8: Cultural Heritage**						
Cultural Heritage	Impacts to Historical and archeological areas	In the event of any chance finds during the works procedures will apply that are governed by GoL legislation and guidelines and as	Records of chance finds.	EIB Standard 10 Law on	Contractor to implement mitigation	Part of general Project

Subject	Potential Impact / Issue	Mitigation Measure / Implementation Plan	Indicators	Standards	Responsibilities	Cost
		outlined in the Contractors Chance Find Procedure. Implementation Plans: • Chance Find Procedure		National Heritage (2014) Decree on the Preservation of Cultural, Historical and Natural Heritage (1997) ESS8		costs
Standard 2: Stakeholder Engagement **ESS10: Stakeholder Engagement and Information Disclosure**						
Stakeholder Engagement	General engagement	Per requirements of the Project SEP and EGEP Implementation Plans: • SEP • EGEP	Per SEP and EGEP	Public Involvement Guideline (2012) EIB Standard 2 ESS10	Contractor to implement mitigation	Part of general Project costs
Greivances	Maintenance impacts	Continue to monitor and address grievances per the GRM. Implementation Plans: • GRM • CESMP	Grievances recorded	Law on Handling of Petitions (2015) EIB Standard 2 ESS10	Contractor to implement mitigation	Part of general Project costs

6. MONITORING PLAN

The overall objective of environmental and social monitoring is to qualitatively and quantitatively measure effectiveness of mitigation measures, and develop appropriate responses to incompliances with Project standards, and emerging environmental and social issues. A framework for monitoring activities and thresholds are provided in this chapter of ESMP to be further developed as more information becomes available before the onset of land preparation and construction phase. Monitoring will be carried out to ensure that all Project activities and mitigation measures comply with the Project standards, MPWT and the Construction Contractor meet their commitments and requirements of this ESMP in terms of periodical audits and reporting. The main objectives of developing a monitoring program and defining parameters are to;

- Control that all mitigation measures are in place,
- Measure effectiveness of the mitigation measures,
- Provide mechanisms for taking timely action when unexpected environmental and social incidents are encountered, and
- Identify training requirements at all levels of the organizational structure.

Roles and responsibilities, monitoring parameters, monitoring frequencies, and Project's monitoring requirements are required to be identified in implementation of the Monitoring Plan. To determine whether monitoring outcomes comply with the Project standards, implementation of mitigation measures will be observed and measured, effectiveness of measures will be verified, all results will be recorded and monitored.

Table 21: Environmental and Social Monitoring Plan

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
Design							
ESIA & ESMP	PTRI	N/A	Design Phase	Review/Documentation	Decree on Environmental Impact Assessment (2019) EIB Standard 1	N/A	Funds already committed.
Climate change in design	ISWS	All Project areas	Design Phase	Documentation	Decree on Climate Change (2019) United Nations Framework Convention on Climate Change (UNFCCC 1995). EIB Standard 5	Design reviews reported to MPWT	Part of ISWS costs
Geohazard risks (including flooding	ISWS	All Project areas	Design Phase	Documentation	National Design Codes for Seismicity EIB Standard 3	Design reviews reported to MPWT	Part of ISWS costs
Noise Consultations and adaptive measures	ISWS	All Project areas	Design Phase	Documentation	National Noise quality standards EIB Standard 3 WBG EHS Noise guidelines	Reporting to MPWT	Dependent upon consultation findings
Traffic safety	ISWS	All Project	Design Phase	Documentation	EIB Standard 9	Design reviews	Part of ISWS

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
		areas				reported to MPWT	costs
Pre-construction Phase							
RAP	/PTRI	All project areas	Pre-Cons.	Documentation	Decree #84 on Compensation and Resettlement of People Affected by Development Projects (2016) Technical Guidelines on Compensation and Resettlement of People Affected By Development Project (2005) EIB Standard 6	N/A	RAP Costs
Stakeholder Engagement Activities	Per SEP Requirements	Per SEP specified locations	Pre-Cons.	Documentation	EIB Standard 2	Routine reporting per SEP requirements	Part of Project costs
Contract Documents	ISWS	N/A	Pre-Cons.	Contract documents	EIB Standard 1	Review of contract documents and reporting to	Part of ISWS costs

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
						MPWT	
E&S Staff	MPWT	N/A	Pre-Cons.	Contract documents	EIB Standard 1	N/A	N/A
CESMP & Associated plans	ISWS	N/A	Pre-Cons.	Documentation	EIB Standard 1	CESMP review reports to MPWT	Part of ISWS costs
Permits	ISWS	All project areas	Pre-Cons.	Documentation	National Ambient Air Quality Standards EIB Standard 1 National requirements for water, air quality, EIA.	Permit review submitted to MPWT	Part of ISWS costs
Road side vendors	MPWT	Where roadside vendors are affected	Pre-Cons.	Documentation	EIB Standard 6	N/A	Part of Project costs
Access	ISWS	Temporary rotes and pathways	Pre-Cons.	Documentation	EIB Standard 6	Monthly reports	Part of Project costs
Induction Training	ISWS	All work sites	Pre-Cons.	Documentation	OHS Plan EIB Standard 8	Monthly reports	Part of Project costs
UXO Clearance	Contractor	All work sites	Pre-Cons.	Documentation	EIB Standard 8	Written reports to ISWS and MPWT	Part of Project costs

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
GRM	ISWS	N/A	Pre-Cons.	Documentation	GRM EIB Standard 2	Review of documents and reporting to MPWT	Part of Project costs
Construction Phase							
Soil Contamination	Contractor	Gas stations (as identified during site inspections)	Pre-construction at identified sites	Soil sampling and analysis (by accredited and competent firms)	National soil quality standards Pollution Prevention Plan EIB Standard 3	Once, per site	500 USD per site.
Noise (Leq)	Contractor	At baseline locations and at locations of complaints case of complaint	Monthly or when complaints are received from residents	Noise level measurements (by accredited and competent firms)	National Noise quality standards Pollution Prevention Plan EIB Standard 3	Monthly Monitoring Reports	100 USD per sample
Vibration - PPV	Contractor	At sites identified by the CVMP	Continuously during works close to identified vibration sources	Own monitoring equipment	CVMP DIN 4150-3, Structural Vibration, Part 3: Effect of vibration on structures Pollution Prevention Plan EIB Standard 3	Monthly Monitoring Reports	2,500 USD per vibration monitoring unit

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
Air emissions - NOx, SO2, PM10, PM2.5	Contractor	At baseline locations and at locations of complaints	Monthly or when complaints are received from residents	AQ measurements (by accredited and competent firms)	National Ambient Air Quality Standards Pollution Prevention Plan EIB Standard 3	Monthly Monitoring Reports	100 USD per sample
Wastewater	Contractor	Construction Site	Daily	Visual observations at site	WBG Indicative Values for Treated Sanitary Sewage Discharges Pollution Prevention Plan EIB Standard 3	Monthly Monitoring Reports	Part of Contractors E&S costs
Surface Water Quality	Contractor	At all bridge construction sites	Monthly during bridge construction works	Sampling and analysis (by accredited and competent firms)	National Surface Water Quality Standards Law on Water and Water Resources (2017) ESIA Project Standards PPP EIB Standard 3	Monthly Monitoring Reports	250USD per site
Camp discharge water	Contractor	Camp sites, batching plants, rock crushing plant	Monthly	Sampling and analysis (by accredited and competent firms)	WBG Indicative Values for Treated Sanitary Sewage Discharges Wastewater Effluent (General Industrial	Monthly Monitoring Reports	250USD per site

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
					Wastewater Discharge) PPP EIB Standard 3		
Drinking water	Contractor	Construction camps	Monthly	Sampling and analysis (by accredited and competent firms)	National Drinking Water Quality Standards - Groundwater Pollution Prevention Plan EIB Standard 3	Monthly Monitoring Reports	250USD per site
Excavation Waste	Contractor	Project Route and Excavation Storage Areas	Continuously during excavations	Documentation and visual observations at site	Pollution Prevention Plan EIB Standard 3	Monthly Monitoring Reports	Part of Contractors E&S costs
Topsoil	Contractor	Project Route and Excavation Storage Areas	Continuously during excavations	Documentation and visual observations at site	Pollution Prevention Plan EIB Standard 3	Monthly Monitoring Reports	Part of Contractors E&S costs
Solid Waste and Packaging Waste	Contractor	Project working areas during construction work	Daily	Documentation and visual observations at site	Pollution Prevention Plan National Waste Management Legislation EIB Standard 3	Monthly Monitoring Reports	Part of Contractors E&S costs

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
Non-Hazardous and Inert Wastes	Contractor	Project working areas during construction work	Daily	Documentation and visual observations at site	Pollution Prevention Plan National Waste Management Legislation EIB Standard 3	Monthly Monitoring Reports	Part of Contractors E&S costs
Hazardous Wastes	Contractor	Project working areas during construction work	Daily	Documentation and visual observations at site	Pollution Prevention Plan National Waste Management Legislation EIB Standard 3	Monthly Monitoring Reports	Part of Contractors E&S costs
Designated sites	Contractor	Phou HiPhi NPA	Weekly during works within 500m of the site	Visual observations at site	Wildlife and Aquatic Law (2008) Forestry Law (2019) United Nations Convention on Biodiversity (CBD 1996 Biodiversity Management Plan EIB Standard 4	Monthly Monitoring Reports	Part of Contractors E&S costs
Fauna and flora species of high	Contractor	All project working areas	Weekly, where site clearance is on-going	Visual inspections, pre-clearance surveys	Wildlife and Aquatic Law (2008) Forestry Law (2019)	Monthly Monitoring Reports	Part of Contractors E&S costs

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
conservation concern					United Nations Convention on Biodiversity (CBD 1996 Biodiversity Management Plan EIB Standard 4		
Storage and transportation of fuel, oil and hazardous materials	Contractor	Project working areas during construction work	Daily	Documentation and visual observations at site	EIB Standard 9 Emergency Response Plan Spill Response Plan	Monthly Monitoring Reports	Part of Contractors E&S costs
Labor and Working Conditions	Contractor	All project working areas	Monthly	Documentation	Labour Law (2013) EIB Standard 8 Labour Management Plan OHS Plan	Monthly Monitoring Reports	Part of Contractors E&S costs
OHS Management	Contractor	All project working areas	Daily	Documentation, Training Records, HS Audits	Labour Law (2013) Decree on Occupational Safety and Health (2019) EIB Standard 8 Labour Management Plan OHS Plan	Monthly Monitoring Reports	Part of Contractors E&S costs

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
Traffic (Transport) Management (number of complaints about traffic problems, number of traffic training provided to workers)	Contractor	Project working areas during construction work	Monthly	Documentation	EIB Standard 9 Community Health and Safety Plan	Monthly Monitoring Reports	Part of Contractors E&S costs
Community health and safety	Contractor	Project working areas during construction work	Daily	Documentation	EIB Standard 9 Community Health and Safety Plan	Monthly Monitoring Reports	Part of Contractors E&S costs
Chance finds	Contractor	Project working areas during construction work	Daily	Documentation	EIB Standard 10 Decree on the Preservation of Cultural, Historical and Natural Heritage (1997)	Monthly Monitoring Reports	Part of Contractors E&S costs

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
					Law on National Heritage (2014)		
Operation							
Noise	MPWT	Baseline measurement points	Annually	Noise level measurements (by accredited and competent firms)	National Noise quality standards EIB Standard 3	Annual Reports	5,000 USD per annum
Solid Waste and Packaging Waste	Contractor	Project working areas during construction work	Daily	Documentation and visual observations at site	Pollution Prevention Plan National Waste Management Legislation EIB Standard 3	Monthly Monitoring Reports	Part of Contractors E&S costs
Non-Hazardous and Inert Wastes	Contractor	Project working areas during construction work	Daily	Documentation and visual observations at site	Pollution Prevention Plan National Waste Management Legislation EIB Standard 3	Monthly Monitoring Reports	Part of Contractors E&S costs
Hazardous Wastes	Contractor	Project working areas during construction	Daily	Documentation and visual observations at site	Pollution Prevention Plan National Waste Management Legislation EIB Standard 3	Monthly Monitoring Reports	Part of Contractors E&S costs

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
		work					
Storage and transportation of fuel, oil and hazardous materials	Contractor	Project working areas during construction work	Daily	Documentation and visual observations at site	EIB Standard 3 Emergency Response Plan Spill Response Plan	Monthly Monitoring Reports	Part of Contractors E&S costs
Labor and Working Conditions	Contractor	All project working areas	Monthly	Documentation	Labour Law (2013) EIB Standard 8 Labour Management Plan OHS Plan	Monthly Monitoring Reports	Part of Contractors E&S costs
OHS Management	Contractor	All project working areas	Daily	Documentation, Training Records, HS Audits	Labour Law (2013) Decree on Occupational Safety and Health (2019) EIB Standard 8 Labour Management Plan OHS Plan	Monthly Monitoring Reports	Part of Contractors E&S costs
Traffic (Transport) Management (number of	Contractor	Project working areas during construction	Monthly	Documentation	EIB Standard 9 Community Health and Safety Plan	Monthly Monitoring Reports	Part of Contractors E&S costs

Parameter	Responsibility	Location	Frequency / Timing	Monitoring Method	Management Plan detailing Monitoring Requirements / Relevant Legislation - Standard	Reporting	Cost
complaints about traffic problems, number of traffic training provided to workers)		work					
Community health and safety	Contractor	Project working areas during construction work	Daily	Documentation	EIB Standard 9 Community Health and Safety Plan	Monthly Monitoring Reports	Part of Contractors E&S costs
Chance finds	Contractor	Project working areas during construction work	Daily	Documentation	EIB Standard 10 Decree on the Preservation of Cultural, Historical and Natural Heritage (1997) Law on National Heritage (2014)	Monthly Monitoring Reports	Part of Contractors E&S costs