

MINISTRY OF TRANSPORT  
DIRECTORATE FOR ROADS OF VIETNAM  
PROJECT MANAGEMENT UNIT 3

June 2013

**VIETNAM ROAD ASSET MANAGEMENT PROJECT**

**Component C: Road Asset Improvement**

**ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

**Component C1: Subproject of 4 bridges longer than 25m including  
Trang Thua, Cong Neo, Trang, Cap on NH38B  
(CAP BRIDGE)**



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**PROJECT'S OWNER**

**Hanoi, June 2013**

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**Acronyms**

CSC	Construction Supervision Consultant
CEMP	Community Environmental Monitoring Program
DRVN	Directorate for Roads of Vietnam
DUNRE	District Unit Natural Resources and Environmental
DONRE	Department of Natural Resources and Environment
EPC	Environmental Protection Commitment
EO	Environmental Officer of Environmental Unit (Under PMU3)
EU	Environmental Unit (under PMU3)
EMP	Environmental Management Plan
EMS	Environmental Management System
GoV	Vietnam Government
IEMC	Independent Environmental Monitoring Consultant
MOT	Ministry of Transport
PR	Provincial Road
NH	National Highway
OP	Operation policies
PMU3	Project Unit Management No.3
RAP	Resettlement Action Plan
SEMP	Site Environmental Monitoring Program
SEO	Safety and Environment Officer
SES	Workplace Safety and Environment Supervisor
WB	World Bank

## **ENVIRONMENTAL MANAGEMENT PLAN**

### **1. Introduction**

#### **1.1. Objectives of the Environmental Management Plan**

The Subproject “Construction of the New Cap bridge and improve the approach roads of bridge.” is one of the subprojects under Component C of the Vietnam Road Asset Management Project (VRAMP) funded by the World Bank. The subproject will be implemented in Doan Dao commune, Phu Cu district, Hung Yen province.

The subproject activities may cause negative impacts on the local environment and communities during pre-construction, construction, and operation phases.

An environmental screening was undertaken in line with the World Bank safeguards policy requirements and it showed that the World Bank’s policies on Environmental Assessment (OP 4.01) and Involuntary Resettlement (OP 4.12) will be triggered for the subproject. The implementation of the subproject would mainly cause increased dust generation, air pollution, and domestic wastes, and traffic safety. However, these impacts are not significant, temporary, localized, and can be mitigated with available mitigation measures. Therefore, the subproject is assessed as B environmental category and eligible for funding by the World Bank.

The Government’s regulation on environmental assessment requires submission of an Environmental Protection Commitment (EPC) for the subproject. An EPC report has been prepared, submitted to the Phu Cu District People’s Committees, Hung Yen province. In addition to fulfilling the government requirements, an Environmental Management Plan (EMP) that complies with the World Bank OP 4.01 has also been prepared for the subproject.

The main objective of this Environmental Management Plan (EMP) is to establish a set of mitigation and monitoring measures to minimize the adverse social and environmental impacts that can take place during the implementation stage of the subproject. The measures especially focus on sensitive receptors or sensitive locations. The EMP also provides specific information about the monitoring program during construction stage including locations, frequency and reporting process.

The EMP addresses all issues identified in the Environmental Protection Commitment (EPC): i) organizes all measures to mitigate environmental impacts during the construction and operation; and (ii) establishes an organizational structure, procedures, institutional responsibilities for implementation, and a budget and source of financing for each activity

The EMP will also assist different stakeholders in managing the environmental issues of the bridge: (a) The PMU3 - to help with the management and implementation of the EMP; (b) supervisors – to ensure that the EMP is properly implemented; (c) environmental engineers – to assist them to work with the Contractors to implement the EMP; and (d) Contractors – to help them develop project-specific EMP implementation plans.

In addition to the project-specific mitigation measures included in the EPC and EMP, the Cap Bridge VRAMP Sub-project will be also in compliance with Vietnamese Standard (TCVN) and National Technical Regulation (QCVN) and the World Bank Safeguard Policies. Appendix 1 presents the most relevant environmental standards of the Socialist Republic of Vietnam.

### **2. EMP Organization and Structure**

The EMP is structured as follows:

**Introduction:** describes EMP objectives and structure of EMP.

**Overview of Environmental and Social Issues:** summarizes the project description and main environmental and social impacts, the approach for identification of environmental issues along the road alignment and summarizes the main mitigation measures.

**Roles and Responsibilities for Environmental Management during Construction:** This part will define the roles and responsibilities for environmental management for all actors involved in the project, and the process of control and reporting.

**Compliance Framework:** This part will define the environmental duties of the contractor (s), and the environmental compliance framework that will be put in place, the environmental standards for all mitigation measures, the environmental supervision of civil works, and the independent monitoring consultant.

**EMP Implementation Plan:** describes the requirements and staffing needs for initiation of the works, for the Contractor and supervision team. It also includes the capacity building and training programs that will need to be implemented for all actors involved in the environmental management of the project.

**Monitoring Program:** an environmental monitoring framework for the project identifies the parameters, frequency, and responsibilities for monitoring environmental impacts during construction and operation of the road.

**Budget:** budget estimates for the implementation of the EMP will be presented.

**Public Consultation and Disclosure:** describes the Public Consultation and the Disclosure Plan of the subproject.

**Appendices:** related to the project and the contents of the EMP

### **3. Project Description**

#### **3.1. Subproject objectives**

The National Highway No. 38B (NH38B) has been improved before; however, until now there are also four (4) bridges that have not been improved including the Cap Bridge. The existing Cap Bridge is a narrow bridge with bad pavement, and therefore, does not meet the traffic develop demand on NH38B.

The main objective of subproject is to construct a new Cap Bridge to ensure smooth vehicle transport on the NH38B.

#### **3.2. Location**

The subproject is located on the NH38B at station Km36+020 and cuts through the Nghia Tru river (a tributary of the Cuu An river). The project belongs to Doan Dao commune, Phu Cu district, Hung Yen province (figure 1). The total length of the subproject is 249.38 meters including the bridge and the access road to the bridge; in which coordinates of starting and ending points are as follows:

+ Starting point of project: 20°43'12"N; 106°09'30"E;

+ Ending point of project: 20°43'01"N; 106°09'25"E.

Along the roadsides of NH38B, there are households. The main economic activity of the households is small business and trade. Other households' main economic activity is agriculture and free labor. Figure 1 describes location of the subproject.



Figure 1. Project Location



### 3.3. Main components of the Subproject

The project will construct the new Cap bridge at the same location of the old bridge. The approach roads to the bridge are designed to scale of grade III plain road. The designed speed is 80 kilometers per hour,  $B_{roadbed}=12.0$  meters.

#### Bridge:

The bridge is designed under the standard 22TCN272-05. The design load is HL-93. The design flood frequency is 1%. The length of bridge is 44.1 meters. The Cross section of bridge is 13 meters.

- + Substructure: wall- type reinforced concrete abutments on foundation with five bored piles D1000, expected pile length  $L = 42m$ .
- + Superstructure: beam – slab span assembled by pre-stressed reinforce concrete, 18m long with 13 beams, beam with height of 0.65 m.
- + Structure of bridge surface layers: 2 layers, waterproof bottom part with thickness of 4mm and upper part of asphalt layer with thickness of 7cm.

#### Access road to bridge ends

- + Approach roads are designed to scale of grade III plain road. Path length to the bridge end is  $L = 214.13$  m.

#### Intersections

- + The project will build three intersections at three locations intersected with local roads (Km0+060; Km0+100; Km0+290). Location map of the intersections is attached in the appendix.

### 3.4. Work volume

Building materials for the project's items are mainly backfill soil, concretes, stones, steel, etc. Volume of construction materials is presented below:

**Table 1. Summaries of Construction Quantities**

Bridge						Approach roads		
Ord	Item	Quantity	Ord	Item	Quantity	Ord	Item	Quantity
1	Water (m <sup>3</sup> )		5	Filing soil (m <sup>3</sup> )	65,322	1	Excavated soil (m <sup>3</sup> )	31,819
2	Cement concrete (m <sup>3</sup> )	3,142	6	Rebar (T)	455	2	Filing soil (m <sup>3</sup> )	122,184
3	Asphalt concrete (m <sup>3</sup> )	161.2	7	Bored pile (m)	2,522.5	3	Asphalt concrete (m <sup>3</sup> )	4,360
4	Excavated soil (m <sup>3</sup> )	10,589						
Bridge						Approach roads		
No.	Item	Quantity	No.	Item	Quantity	No.	Item	Quantity
1	Soil excavation (m <sup>3</sup> )	1,759	5	Steel girder (T)	6.642	1	Soil excavation (m <sup>3</sup> )	788
2	Filling soil (m <sup>3</sup> )	541	6	Bored piles (m)	420	2	Filling soil (m <sup>3</sup> )	2,575
3	Concrete (m <sup>3</sup> )	540	7	Water drainage	8	3	Concrete (m <sup>3</sup> )	421
4	Blinding macadam (m <sup>3</sup> )	49	-	-	-	4	Crushed stone	1,451

*Source: Design interpretation of the Project*

The amount of materials that will be used for the subproject is not much; therefore, opening of the new borrow pits or quarries are not needed. The Constructor can buy material (e.g. soil,

bitumen, concrete, asphalt, etc.) from local borrow pits, sand mines, and quarries. When construction starts, the contractor shall require this borrow pit and quarry owners to submit the certificate environmental protection commitment for these borrow pits.

List of material mines and yards to be used for the project are presented in the following table:

**Table 2. List of Material Mines And Yards**

No.	Mines	Type of materials	Transportation distance (Km)	Transportation road
1	Kien Khe Mine	Crushed stone aggregate	48 km to end of NH38B	NH38B and NH1A
2	Yen Lenh Mine	Sand	About 13 km	NH38B
3	Van Diem Yard	Sand	About 10 km	NH200, NH38B, Dike road of Luoc River
4	Trieu Duong Yard	Sand, Crushed stone aggregate	About 50km.	NH38B
5	Thong Nhat Mine	Crushed stone aggregate	About 80km	NH38B and NH39
6	Han Yard	Sand	48 km to end of NH38B	

#### 4. Environmental and Social Impacts

##### 4.1. Social impacts due to land acquisition

The subproject will acquire a small piece of land for the construction of the bridge. PMU3 has prepared a simplified Resettlement Policy Framework (RPF) that spells out principles of OP 4.12, the updated national laws/regulations, and proposed policies and entitlement applied to VRAMP. A combined resettlement plan (RP) has also been prepared for the construction of the four bridge subprojects under the VRAMP, including this subproject. The RP includes specific a program to relocate house, land, graves, and other structures of the community. In initial survey, the quantities of land clearance are presented in table below:

**Table 3. Quantities of land clearance**

No.	Items	Unit	Quantity
1	Annual Crop land	m <sup>2</sup>	-
2	Aquaculture land	m <sup>2</sup>	-
3	Rural land	m <sup>2</sup>	149.2
<b>Total</b>			<b>149.2</b>

##### 4.2. Environmental Impacts

Tables 4 below summarize the potential environmental and social impacts during construction phase of the project:

**Table 4. The summary of impacts on environmental due to wastes**

Activity	Potential Impacts	Location	Impact level
<b>Potential impacts during preparation and construction stage</b>			
Preparation of site clearance	The generate dust: Pollution of air and impact on community health.	<u>Location:</u> There are households (5-6 households) living in scope of 35 meters around the construction site. <u>Time:</u> about 7 to 10 days during construction stage.	Small
The excavation and filling activities The machinery activities		<u>Location:</u> Residential area along the construction scope of approach road with 50 meters of distance from construction. <u>Time:</u> 9 months.	Medium
Transporting and storing of materials		<u>Location:</u> People and other objects along the transportation roads with 50 meters of distance from those roads. <u>Time:</u> 9 months.	Medium
Activities of concrete batching Machinery maintenance activities Life activities of the workers	Waste water: - Pollution of surface water - Impact on life of flora and fauna that living in water environmental of rive around the construction site.	<u>Location:</u> Nghia Tru river (at construction site) <u>Time:</u> 9 months.	Small
Demolition of the old bridge Construction of bridge (excavation and backfilling of abutment, construction of the substructure) and soil disposals. Soil and sludge disposal that including Bentomite Solid wastes (domestic wastes).	Solid wastes: - Environmental pollution caused by solid wastes. - Effect to river flow of Nghia Tru river due to waste dumping.	<u>Location:</u> - Construction area and around areas. - Nghia Tru river <u>Time:</u> 9 months.	Small
Construction of drilling pipe	Risk of ground water pollution	<u>Location:</u> Area around the drilling pipe construction location	Small

Activity	Potential Impacts	Location	Impact level
Machinery maintenance activities	Oil wastes and wastes including oils (wiper) pollution of the surface water.	<u>Location:</u> Nghia Tru river (at construction site) <u>Time:</u> 9 months.	
Excavation of roadbed and abutment	Dumping soils, soil erosion impact on socio-economic condition in residential area, impact on traffic on NH38B and local roads.	<u>Location:</u> The households living near by the approach road and traffic activities on the NH38B. <u>Time:</u> 9 months	Medium
Materials storing			
Rain water running of the construction area	Entrainment of contaminants as wastes, oils, etc.	<u>Location:</u> Nghia Tru river (at construction site). <u>Time:</u> 9 months.	Small
Ground leveling of the construction area	Noise pollution	<u>Location:</u> Around the construction site. <u>Time:</u> 2 weeks.	Medium
Construction of bridge and approach road.	Noise pollution due to machineries and transportation activities.	<u>Location:</u> At the residential areas that are located in scope of 40 meters around the construction area and the households living along the transportation roads. <u>Time:</u> 9 months.	
Related activities (transportation, batching, etc.)			
Construction workforce	Each package, there are usually twenty workers The issues impact on diseases and community health.	<u>Location:</u> Community in subproject area <u>Time:</u> 9 months.	Small
Machinery activities	Safety and congestion of traffic	<u>Location:</u> NH38B, the approach road area and along the transportation roads; <u>Objects:</u> Traffic on existing roads People living along the approach roads	Medium
Transportation of materials and wastes	Damages of public facilities	<u>Location:</u> NH38B and local roads. <u>Objects:</u> Local peoples	Medium
Arrangement of machineries on the river	Impacts on hydrology of the river.	<u>Location:</u> Abutment areas <u>Objects:</u> Nghia Tru river	Small

Activity	Potential Impacts	Location	Impact level
<b>Potential impacts during operation stage</b>			
Activities of vehicles on the road and bridge	<ul style="list-style-type: none"> <li>- Risk due to inadequate maintenance of the bridge</li> <li>- May cause bridge failure in the daily traffic and/or more dangerously in the large floods.</li> </ul>	<p><u>Location:</u> Cap bridge.</p> <p><u>Time:</u> after operation stage.</p>	Small

## 5. Mitigation Measures

### 5.1. Mitigation Measures for Social Impacts

The subproject has proposed measures to mitigate the social impacts due to land acquisition in accordance with the VRAMP RPF and the subproject RP including:

- Compensation for land acquisition.
- An income restoration program to help the severely affected and vulnerable households rebuild their sources of livelihood and thus regain, if not improve, their pre-project standards of living;
- Changes in alignment of some sections that go through the residential area to mitigate social impacts due to land acquisition and resettlement.

### 5.2. Mitigation Measures for Environmental Impacts

Table 5 below describes specific areas that can be affected by potential environmental impacts along with respective mitigation measures.

**Table 5. Site Specific Mitigation Measures of the Project**

No.	Impacts/Activity	Mitigation measures	Location
<b>I. Measures to mitigate the Impacts during construction stage</b>			
<i>1.1. Measures to mitigate impacts due to wastes</i>			
	Management and treatment of solid wastes (including solid waste generated from demolition of the old bridge)	<ul style="list-style-type: none"> <li>- Conduct the classification and treatment.</li> <li>- Re-use to build the construction road.</li> <li>- Collect and select temporary storage.</li> <li>- Moving the waste to local landfills.</li> <li>- Move the demolition materials of the old bridge from the river if they fall into the river and transport to the dumping area according to the regulation.</li> </ul>	Construction sites
	Treatment of hazardous waste (waste oil)	<ul style="list-style-type: none"> <li>- Management of wasted oils.</li> <li>- Control oil-containing wastes from construction activities: Do not discharge directly into the environment, collecting the waste oil into the drum container for disposal.</li> </ul>	Construction sites

No.	Impacts/Activity	Mitigation measures	Location
	- Air pollution due to dust generated from construction (including excavation, material storage): - Air pollution due to dust arising from transport activities;	- Water spray. - Cover material/ soil disposal when transported. - Vehicles only move within construction area. - Use covered vehicles while transporting. - Control and manage environmental issues at locations that vehicles go through. - Locate temporary dumping sites far from objects as schools, markets.	All of project Construction site gate
<b>1.2. Measures to mitigate the other impacts</b>			
	Minimize impacts of erosion, sediment and soil drifting	- Quick construction and compaction. - Collecting and transporting the soil disposal to the backfill area. - Create the dump reasonably. - Setup the silt fences. - Clean up spilled lands. - Limit the leveling area. - Make manholes.	Location construct road-bed of approach road
	Minimize impacts due to noise pollution	- Comply with the general regulations. - Control the noise level: priority using machineries that have low of source noise level. - Monitoring the noise level. - Not working during rest time of the local community	Along the construction area of approach road, especially with area focusing the population
	Minimize impacts due to traffic congestion	- Comply with the general regulations. - Setup the signal boards. - Guiding traffic to ensure the traffic flow on NH38B.	Approach road
	Minimize impacts due to damage to public facilities	- Arranging reasonable shipping time: do not transport materials during the period 6 – 8 hours and 18 – 16 hours. - Moving with right speed. - Agree with local authorities about the temporary using of local road.	NH38B and local roads
	Minimize impact by workers	- Management of workers: To register temporary living for workers, construction workers education. - Coordinate with local authorities in promoting workers understanding of the social evils, prostitution, disease, HIV etc. - Use of local labor for simple work.	Construction site
	Minimize impacts on hydrology and river flow	- Treated wastes when constructing the sub-structure of bridge.	Cuu An river

No.	Impacts/Activity	Mitigation measures	Location
		- Cleanup the river-bed after construction. - Cleanup and stabilize the river banks after construction.	
<b>II. Measures to mitigate the impacts during operation stage</b>			
	Risk due to inadequate maintenance of the bridge	- Can be mitigated during detailed design. - Institutional capacity building component could also help reducing the risk.	The bridge

**Chance Find Procedures**

If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:

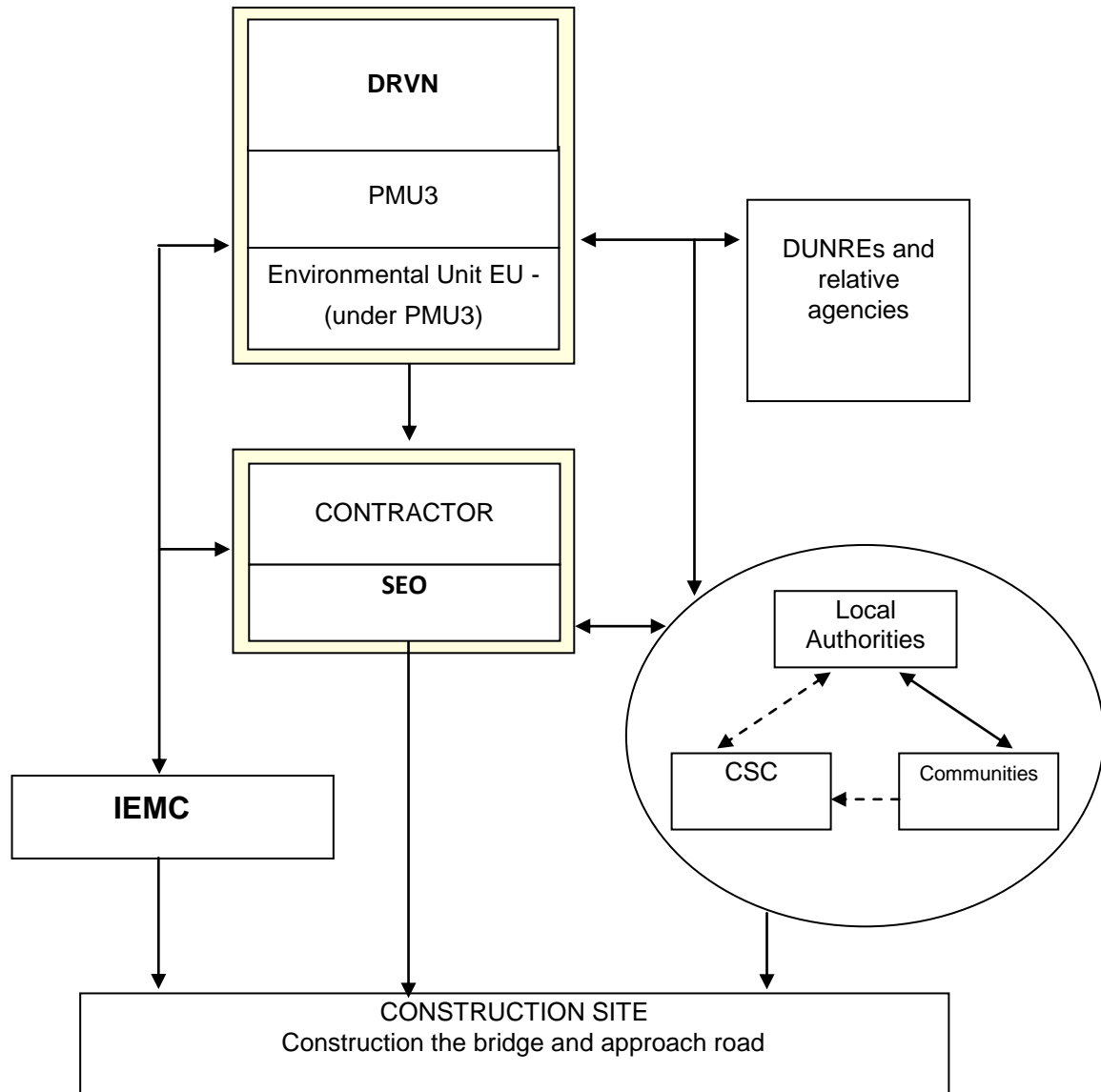
- Stop the construction activities in the area of the chance find.
- Delineate the discovered site or area.
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Department of Culture and Information takes over.
- Notify the Construction Supervision Consultant who in turn will notify responsible local or national authorities in charge of the Cultural Property of Viet Nam (within 24 hours or less).
- Relevant local or national authorities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values.
- Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage.
- If the cultural sites and/or relics are of high value and site preservation is recommended by the professionals and required by the cultural relics authority, the Project’s Owner will need to make necessary design changes to accommodate the request and preserve the site.
- Decisions concerning the management of the finding shall be communicated in writing by relevant authorities.

**6. Roles and Responsibilities of Environmental Management Stakeholders**

Proper environmental management during construction requires the involvement of several stakeholders and agencies, each with different roles and responsibilities including:

- Project owner: DRVN, PMU3;
- DUNREs (District Unit of Natural Resources and Environment) of Phu Cu district in Hung Yen province and relative agencies;
- Contractor;
- Local communities;

The relationship and interaction among different stakeholders in environmental management of the subproject are presented in the figure below:



**Figure 2. Environmental Management System of the Cap Bridge**

Specific responsibilities of the stakeholders are presented in Table 6 below:

**Table 6. Roles of Responsible Stakeholders**

No.	Company/ Unit	Responsibilities
1	DRVN/ PMU3	<p>DRVN, the Project implementing agency, will be responsible for overseeing the project implementation.</p> <p>PMU3, representative of the DRVN, will be responsible for monitoring the overall project implementation, including environmental compliance of the project. PMU3 will have the final responsibility for environmental performance of the project during both the construction and operational phases.</p> <p>Specifically PMU3 will: i) closely coordinate with local authorities in the participation of the community during project preparation and</p>



No.	Company/ Unit	Responsibilities
		<p>implementation; ii) monitor and supervise EMP implementation including incorporation of EMP into the detailed technical designs and bidding and contractual documents; iii) ensure that an environmental management system, as indicated in Figure 2, is set up and functions properly; iv) be in charge of reporting on EMP implementation to the DRVN and the World Bank.</p> <p>In order to get effectiveness in the implementation process, PMU3 will establish an environmental unit with at least two environmental staff to help with the environmental aspects of the project.</p>
2	Environmental Unit (under PMU3)	<p>The Environmental Unit is responsible for monitoring the implementation of WB's environmental safeguard policies in all stages and process of the project. Specifically, this unit will be responsible for:</p> <p>i) reviewing the subproject EPC and EMP prepared by consultants to ensure quality of the documents; ii) helping PMU3 incorporate EMPs into the detailed technical designs and civil works bidding and contractual documents; iii) helping PMU3 incorporate responsibilities for EMP monitoring and supervision into the TORs, bidding and contractual documents for CSC and IEMC; iv) providing relevant inputs to the consultant selection process; v) reviewing reports submitted by the CSC and IEMC; vi) conducting periodic site checks; vii) advising PMU3's leaders on solutions to environmental issues of the project; and viii) preparing environmental performance section on the progress and review reports to be submitted to the DRVN and the Bank.</p>
3	CSC	<p>The Construction Supervision consultant (CSC) will be responsible for supervising and monitoring all construction activities and for ensuring that Contractors comply with the requirements of the contracts and the EMP. The CSC shall engage sufficient number of qualified staff (e.g. Environmental Engineers) with adequate knowledge on environmental protection and construction project management to perform the required duties and to supervise the Contractor's performance. The Environmental Engineers shall be lead by a <i>Workplace Safety and Environment Supervisor (SES)</i> who shall have extensive experience (at least 5 years experience is required) in environmental management, supervision and monitoring on construction projects and be familiar with Viet Nam environmental legislatives requirements.</p> <p>The terms of Reference for the CSC shall be clearly stipulated in the contract signed between CSC and PMU3.</p>
4	Contractor	<p>Based on the approved EMP, the Contractor will be responsible for establishing a site-specific EMP for each construction site area, submit the plan to PMU3 and CSC for review and approval before commencement of construction. In addition, it is required that the Contractor get all permissions for construction (traffic control and diversion, excavation, labor safety, etc before civil works) following current regulations.</p> <p>The contractor shall be required to appoint a competent individual as the contractor's on-site <i>Safety and Environment Officer (SEO)</i> who will be responsible for monitoring the contractor's compliance with the EMP requirements and the environmental specifications.</p>

No.	Company/ Unit	Responsibilities
5	Independent Environmental Monitoring Consultant (IEMC)	<p>IEMC will, under the contract scope, provide support to PMU3 to establish and operate environmental management systems, offers suggestions for adjusting and building capacity for relevant agencies during the implementation period and monitor the Contractor’s EMP implementation in both construction and operation stages. IEMC will also be responsible to support PMU3 to prepare monitoring reports on EMP implementation and submit these reports to DRVN for approval.</p> <p>The IEMC shall have extensive knowledge and experience in environmental monitoring and auditing to provide independent, objective and professional advice on the environmental performance of the project.</p>
6	DUNREs (District Environmental Resources Agency)	<p>With the role of state management in the environmental field, DUNREs will be responsible for monitoring and management environmental issues from project implementation process in district area.</p>

**7. Environmental Compliance Framework**

**7.1. Environmental Duties of the Contractor**

The Contractor, and his sub-contractor and employees firstly shall adhere to minimize the impact that may be result from the project construction activities and secondly, the mitigation measures set down in these EMP to prevent harm and nuisances on local communities, impacts in construction and operation on the environment.

Remedial actions that cannot be effectively carried out during construction should be carried out on completion of the works (and before issuance of the acceptance of completion of works)

The duties of the Contractor and his Sub-Contractors include but not limiting to:

- Compliance with relevant legislative requirements governing the environment, public health and safety;
- Work within the scope of contractual requirements and other tender conditions;
- Organize representatives of the construction team to participate in the joint site inspections undertaken by the SES;
- Carry out any corrective actions instructed by the environmental officer of the Environmental Unit (under PMU3) or the SES;
- Provide and update information to the Environment Unit regarding works activities which may contribute, or be continuing to the generation of adverse environmental conditions;
- In case of non-compliances/discrepancies, carry out investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impact;
- Stop construction activities, which generate adverse impacts upon receiving instructions from the environmental officer (under PMU3) or the SES. Propose and carry out corrective actions and implement alternative construction method, if required, in order to minimize the environmental impacts; Major non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the environmental officer (under PMU3).

Detailed Environmental specifications for Contractors are included in Appendix 3.

## **7.2. Contractor's Safety and Environment Officer (SEO)**

The Contractor shall be required to appoint a competent individual as the Contractor's on-site *Safety and Environment Officer (SEO)*. The SEO must be appropriately trained in environmental management and must possess the skills necessary to transfer environmental management knowledge to all personnel involved in the contract. The SEO will be responsible for monitoring the Contractor's compliance with the EMP requirements and the environmental specifications. The duties of the SEO shall include but not be limited to the following:

- Carry out environmental site inspections to assess and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and adequacy of environmental mitigation measures implemented;
- Monitor compliance with environmental protection measures, pollution prevention and control measures and contractual requirements;
- Monitor the implementation of environmental mitigation measures;
- Prepare audit reports for the environmental monitoring data and site environmental conditions;
- Investigate complaints and recommend any required corrective measures;
- Advise the Contractor on environment improvement, awareness and proactive pollution prevention measures;
- Follow the procedures in the EMP and recommend suitable mitigation measures to the Contractor in the case of non-compliance. Carry out additional monitoring of noncompliance within the specified timeframe instructed by the environmental officer (under PMU3);
- Liaison with the Contractor and environmental officer (under PMU3) on all environmental performance matters; and Contractor's submission of EMP Implementation Plan reports to the environmental officer (under PMU3), SES, and relevant administrative authorities, if required;
- Keep detailed records of all site activities that may pertain to the environment.

## **7.3. Environmental Supervision during Construction**

During construction, the environmental supervision shall be carried out by a qualified Construction Supervision Consultant (CSC) reporting to the PMU3. The CSC is responsible for inspecting, and supervising all construction activities to ensure that mitigation measures adopted in the EMP are properly implemented, and that the negative environmental impacts of the project are minimized. The CSC shall engage sufficient number of qualified staff (e.g. Environmental Supervision Engineers) with adequate knowledge on environmental protection and construction project management to perform the required duties and to supervise the Contractor's performance.

The Environmental Engineers shall be led by a *Workplace Safety and Environment Supervisor (SES)* who shall have extensive knowledge and experience (at least 5 years experience is required) in environmental management, supervision and monitoring on construction projects to provide, objective and professional advice to the client on the environmental performance of the project. The SES shall be familiar with the environmental

legislatives requirements of the Socialist Republic of Viet Nam. Depending on the project requirements, the SES may be required to work full-time on-site.

The SES shall:

- Review and assess on behalf of the PMU3 whether the construction design meets the requirements of the mitigation and management measures of the EPC and EMP,
- Supervise implementation of site-specific environmental management plan of Contractors including their performance, experience and handling of site environmental issues, and provide corrective instructions;
- Review the EMP implementation by the Contractors and Sub-Contractors, verify and confirm environmental supervision procedures, parameters, monitoring locations, equipment and results;
- Report EMP implementation status to PMU3 and prepare the environmental supervision statement during the construction period; and
- Approve invoices or payments.

Terms of reference for the Environmental Supervision Engineers are included in Appendix 4.

#### **7.4. Independent Environmental Monitoring Consultant (IEMC)**

In order to minimize the environmental impacts during construction of the Road Project, the project proponent shall ensure that Project-specific monitoring and audit requirements are established for the project. The monitoring and audit shall be carried out by an Independent Environmental Monitoring Consultant (IEMC) appointed by PMU3. PMU3 will hire a competent firm to carry out independent environmental monitoring of all subproject under the VRAMP project.

IEMC will be responsible for carrying out environmental sampling and monitoring twice a year, on all environmental-related issues regarding the Contractor's works. IEMC will check, review, verify and validate the overall environmental performance of the project through regular inspections and review. This review will provide confirmation that the reported results are valid and that the relevant mitigation measures and monitoring program provided in the Project EMP are fully complied with. He/she will also supply specialized assistance to PMU3 and the Environment Officer of PMU3 in environmental matters.

Terms of reference for the Independent Environmental Monitoring Consultant are included in Appendix 5.

#### **7.5. Compliance with Legal and Contractual Requirements**

The constructions activities shall comply not only with contractual environmental protection and pollution control requirements but also with environmental protection and pollution control laws of the Socialist Republic of Viet Nam.

All the works method statements submitted by the Contractor to the environmental officer (under PMU3) for approval shall also be sent to the SES to see whether sufficient environmental protection and pollution control measures have been included.

The SES shall also review the progress and program of the works to check that relevant environmental laws have not been violated, and that any foreseeable potential for violating the laws can be prevented.

The Contractor(s) shall regularly copy relevant documents to the SEO and the SES. The document shall at least include the updated Work Progress Reports, the updated Works Program, and the application letters for different license/permits under the environmental protection laws, and all the valid license/permit. The SES and the SEO shall also have access,

upon request, to the Site Log-Book.

After reviewing the documents, the SEO or the SES shall advise the environmental officer (under PMU3) and the Contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the SEO or the SES concludes that the current status on license/permit application and any environmental protection and pollution control preparation works may not comply with the works program or may result in potential violation of environmental protection and pollution control requirements by the works in due course, they shall advise the Contractor and the environmental officer (under PMU3) accordingly.

## **8. EMP Implementation Plan**

### **8.1. Contractor's EMP Implementation Plan**

Prior to commencement of construction, the Contractor will be required to submit an EMP Implementation Plan to the PMU3 based on the Contractor's actual construction methodologies, work program, and management of construction activities and management of the workforce during construction. The EMP Implementation Plan shall demonstrate compliance with Vietnamese environmental requirements, the mitigation measures set down in these specifications and The World Bank environmental policies. The content of the Contractor's EMP shall be in line with the project specific EMP. The Plan shall be certified by the SEO and verified in accordance with the project and the EPC requirements and, approved by the SES and PMU3.

The Contractor's EMP Implementation Plan shall provide details such as commitment to environmental protection by the Contractor's Project Management Team; methodology of implementing the project EMP; detailed designs and installation of pollution control facilities (e.g. drainage channel, settling tank, temporary noise barrier, etc); environmental control mechanism; detailed earthworks management plans and site operation plans outlining the measures that are proposed to minimize, mitigate and manage the effects, for the duration of the construction works; and environmental monitoring program during different stages of construction period.

### **8.2. Project Initiation and Staffing**

It is anticipated that the CSC and the SES, will be mobilized one month before the start of the construction activities. The one month start up time will be utilized by the SES to review and familiarize itself with the project, the project design, the technical specifications, contract documents, the EPC, EMP and RAP reports and other project relevant documents and reports. Following the review, the SES will prepare a brief report on the potential issues and challenges arising from the implementation of the EMP and the condition of contracts and make recommendations to the PMU3 about how best to improve the implementation of the EMP. The SES is expected to be mobilized at the beginning of the contract, to prepare the necessary guidelines, documentation, training, etc.

### **8.3. Capacity Building and Training**

Actual implementation of projects shows that coordination in environmental management is not always effective because of the following reasons:

- Local staff do not master loans borrowing process of project but carry out practices involving and following those of domestic projects with limited participation;
- The community does not have obvious awareness on their rights and obligations on environmental protection or in spite of understanding, there is a lack of regime to provide feedback;

- Relevant agencies were not always ready in coordinating works during project implementation. Some agencies assigned their functional staff to coordinate with the project but this assignment is only temporary and appointed staffs do not master the coordination method as well as necessary procedures for discussion and contact with PMU3.

In order to overcome these matters, it is necessary to analyze and assess the capability and demands of relevant departments/divisions in environmental management and analyze actual demands for project implementation. Accordingly, a capacity building and training program will be established to increase the effective operation of environmental management systems in the future. Some assessments on training demands in environmental management as well as proposals for a training program are presented in Appendix 6.

## **9. Monitoring Program**

### **9.1. Objectives**

It is essential to design the monitoring program and monitoring frequency appropriately to be able to demonstrate both the overall performance of the project works as well as the short-term impact due to peak construction activities. More specifically, as the integral and critical part of the EMP, the environment monitoring program should have the following objectives:

- Determine the actual extent of the impacts;
- Control impacts which are generated from construction process and mentioned in EPC report;
- Check environmental pollution standards applied to the project during construction;
- Check and supervise implementation of environmental protection solutions during construction based on EPC report.
- Suggest mitigation measures in case of unexpected impacts;
- Suggest to the Client to coordinate with central and local environmental organizations to solve pending issues relating to environmental protection under the scope of the Project;
- Assess the effect of mitigation measures in pre-construction, construction and operation stages;
- Confirm the impacts forecasted in the EPC.

### **9.2. Site Inspections**

The SEO and the SES shall carry out a monitoring program on a daily or as needed basis at the designated monitoring locations and the regular site inspections. The monitoring program shall include:

- Monitoring of the noise level at the sensitive receptor by portable monitoring kit; the monitoring shall take place during the heavy construction activities, such as excavation, piling, power generation, material transportation and night time construction, if any and shall be conducted near villages, schools, and other sensitive receptors along the project alignment;
- Visual inspection to check the air-borne dust, during demolition, bulk material handling and storage, transportation routes near the resident areas;
- Visual inspection to check the water quality in the receiving rivers, fish ponds and lakes affected by the construction activity such as turbid, smell, color, etc.
- During the peak construction period or at the request from PMU3, once non-compliance

with environmental quality performance criteria is identified, additional monitoring shall be carried out.

- The SEO and the SES shall refer to the following information/documentation in conducting the inspection:
- The contractor's environmental performance, and EMP Implementation program;
- Good practices and general environmental mitigation measures;
- Compliance with the EMP requirements, contractual specification and Vietnamese legislation;
- Protection to sensitive locations and control mechanism of the restricted areas;
- The contractor's construction methodologies and condition of construction plant;
- Individual works methodology proposals (which shall include proposal on associated pollution control measures);
- Works progress and program;
- The adequacy and efficiency of the contractor's pollution control measures/ treatment facilities for minimizing environmental impacts;
- Landscaping and soil erosion controls;
- Location, management and pollution control at the waste/material storage areas, borrow pits and access roads;
- Previous site inspection results.

The Contractor shall update the SEO and the SES with all relevant information of the construction contract to carry out the site inspections. The inspection results and its associated recommendations on improvements to the environmental protection and pollution control works shall be timely submitted to PMU3 and the Contractor for reference and for taking immediate action.

### **9.3. Monitoring Indicators**

The environmental monitoring program will be implemented during construction and operation process at 4 levels:

- (i) Monitoring project completion Indicator;
- (ii) Monitoring the level of compliance with mitigation measures;
- (iii) Community-based Monitoring;
- (iv) Monitoring environmental parameters;

Details of the monitoring program proposed are presented below.

#### ***Monitoring project completion indicator***

A system of monitoring indicators is proposed to assess implementation of some project stages. These monitoring indicators which represent characteristics of sub-project activities can be collected easily based on experiences obtained from similar WB funded infrastructure investment projects in Viet Nam. Based on initial objectives, the following activities will be established, including socio-economic effect, environment, and sustainable development.

These indicators will be stated in the manuals that provides guidance on project implementation. The main environmental indicators related to project investment effect includes but not be limited by the following matters:

- Decrease in the level of pollution load on Cap Bridge and related axis roads.
- Decrease in the level of accidents on Cap Bridge and related axis roads.

This monitoring will be implemented after road completion. PMU3 will be responsible for collecting the information necessary to prepare periodical reports on project completion indicators with the help of a technical consultant.

***Monitoring compliance with mitigation measures***

The monitoring assignments for the Contractor, CSC shall be clearly indicated in their terms of reference and contract documents shall be approved by the World Bank. CSC will be responsible for submitting monthly reports which state environmental problems, actions and updated monitoring results. CSC will be responsible for preparing and submitting every three months reports to PMU3, which shall include conclusions on environmental problems and the key implemented mitigation measures. Quarterly reports, prepared by PMU3, shall comprise the following aspects:

- A priority list of issues as determined in monitoring reports of the previous months.
- Methods taken by the Contractor to solve relevant.
- Pending matters, proposed solutions and explanation of special circumstances for non-compliance.

***Community-based Monitoring***

The communities will monitor the project along its construction process in order to ensure that the contractors will comply with all environmental and social regulations as well as to reduce the risks on their properties and economic activities, human health and the environment. According to the information phase, the communities help to assess the mitigation measures as well as interested in the aspirations of the people, to contribute to a better environment management mechanism.

Community-based monitoring will form the spirit of voluntary report and mention the urgent issues. When there is damage to the environment, the community and local authorities will report to stakeholders.

***Environmental quality monitoring indicators***

The environmental monitoring program will be implemented during 2 stages of the project including the construction stage and operation stage (the two year of project execution). In addition to the daily inspections and noise monitoring to be carried out by the CSC and SEO, the IEMC will carry out periodic monitoring with sampling and laboratory analysis as shown in Table 7. Selected locations are determined based on construction progress and monitoring time).

**Table 7. Environmental Monitoring Requirements**

No.	Monitoring items	Construction stage	Operation stage	Note
<b>I</b>	<b>Monitoring noise</b>			
1.	Monitoring parameter	Leq	Leq	
2.	Monitoring frequency	Measure once every 03 months. 01 location/day, Measure sixteen times /day, 3	Measure once every 06 months. 01 location/day, Measure sixteen times	



No.	Monitoring items	Construction stage	Operation stage	Note
		samples/once	/day, 3 samples/once	
3.	Frequency of taking samples	1 locations x 12 x 3 x 9 months of construction (as expected) / 3	1 locations x 12 x 3 x 2 x 2 years	
4.	Standard for comparison	QCVN 26: 2010/ BTNMT		
<b>II</b>	<b>Monitoring Vibration</b>			
1.	Monitoring parameter	Leq	Leq	
2.	Monitoring frequency	Measure once every 03 months. 01 location/day, Measure twelve times /day, 3 samples/once	Measure once every 06 months. 01 location/day, Measure twelve times /day, 3 samples/once	
3.	Frequency of taking samples	1 locations x 12 x 3 x 9 months of construction (as expected) / 3	1 locations x 12 x 3 x 2 x 2 years	
4.	Standard for comparison	QCVN 27: 2010/ BTNMT		
<b>III</b>	<b>Monitoring air quality</b>			
1.	Monitoring parameter	TSP, PM10	TSP, PM10	
2.	Monitoring frequency	Measure once every 03 months. 01 location/day, Measure eight times /day	Measure once every 06 months. 01 location/day, Measure eight times /day	
3.	Frequency of taking samples	1 location x 8 x 9 months of construction (as expected) / 3	1 location x 8 x 2 x 2 years	
4.	Standard for comparison	QCVN 05:2009/ BTNMT		
<b>IV</b>	<b>Monitoring surface water quality</b>			
1.	Monitoring parameter	Temperature, pH, Turbidity, conductivity, DO, COD, BOD <sub>5</sub> , TSS, Coliform		
2.	Monitoring frequency	Measure once every 03 months. 01 location/day		
3.	Frequency of taking samples	1 locations x 9 months of construction (as expected) /3		
4.	Standard for comparison	QCVN 08:2009/ BTNMT		

#### 9.4. Monitoring Equipment and Records

The equipment and test methods to be adopted for the monitoring works shall comply with the requirements stipulated in the relevant environmental quality standards of the Socialist

Republic of Viet Nam. The monitoring equipment shall be calibrated regularly and calibration of equipment is required prior to the in-site measurement. All the calibration records and monitoring results shall be properly documented for future reference and audit by the concerned parties and the PMU3.

If laboratory analyses are required, the measurement and analysis shall be conducted by an accredited laboratory. Test methods and equipment shall comply with the national requirements and the technical specifications detailed in the relevant environmental quality standards.

Any changes to the monitoring equipment and monitoring methodology shall be approved by environmental officer (under PMU3) and PMU3, and verified by the IEMC, if required in advance. Records shall be kept on site where possible for each project activity for easy access during site supervision or inquiries.

**9.5. Monitoring Report System**

In order to exchange information effectively, establish a database for monitoring the implementation of mitigation measures, and create an effective implementation of EMP, it is essential to adopt a system of standard report at all levels of management as shown in table 8 below.

**Table 8. System of Environmental Monitoring Report**

No.	Issues to be reported	Monitoring at 1 <sup>st</sup> level	Monitoring at 2 <sup>nd</sup> level	Monitoring at 3 <sup>rd</sup> level (One duplicate must be sent to DUNREs)
<b>Construction stage</b>				
1	Implement mitigation measures on site in accordance with the EMP and contract clauses	<b>Implemented by:</b> Contractor <b>Frequency of report submission:</b> Monthly <b>Report sent to:</b> PMU3	<b>Implemented by:</b> PMU3 <b>Frequency of report submission:</b> once every three months <b>Report sent to:</b> DRVN	<b>Implemented by:</b> DRVN <b>Frequency of report submission:</b> once every three months <b>Report sent to:</b> MOT
2	Monitoring and supervision of the EMP compliance in accordance with the contract clauses	<b>Implementation Unit:</b> Construction Supervision Team (CSC) <b>Frequency of report submission:</b> Monthly – Quarterly <b>Report sent to:</b> PMU3	<b>Implemented by:</b> PMU3 <b>Frequency of report submission:</b> once every three months <b>Report sent to:</b> DRVN	<b>Implemented by:</b> DRVN <b>Frequency of report submission:</b> once every three months <b>Report sent to:</b> MOT,
3	Community monitoring of EMP implementation	<b>Implemented by:</b> Monitoring by community group <b>Frequency of report submission:</b>	<b>Implemented by:</b> Local authority <b>Frequency of report submission:</b> In	

No.	Issues to be reported	Monitoring at 1 <sup>st</sup> level	Monitoring at 2 <sup>nd</sup> level	Monitoring at 3 <sup>rd</sup> level (One duplicate must be sent to DUNREs)
		Monthly <b>Send report to:</b> Local authority	cases of reflection/complaints. <b>Report sent to:</b> PMU3	
<b>Operation stage</b>				
1	Environment and Traffic Monitoring		<b>Implemented by:</b> Functional company of DRVN <b>Frequency of report submission:</b> once every six months <b>Report sent to:</b> DRVN	<b>Implemented by:</b> DRVN <b>Frequency of report submission:</b> once every six months <b>Report sent to:</b> MOT
2	Traffic safety monitoring			<b>Implemented by:</b> Functional company of DRVN <b>Frequency of report submission:</b> once every six months <b>Report sent to:</b> MOT

### 9.6. Environmental Claims and Penalty System

As part of the compliance framework, if non-compliance with environmental regulations are discovered by IEMC/CSC during the site supervision, 2% values of interim payment of the contractor of this month will be keeping. The Contractor will be given a grace period (determined by CSC) to repair the violation. If the Contractor performs the repairs within the grace period (confirmed by CSC), no penalty is incurred and keeping money will be pay for next month. However, if the Contractor fails to successfully make the necessary repairs within the grace period, the Contractor will pay the cost for a third party to repair the damages (deduction from keeping money).

In case of IEMC/CSC not detected of non-compliance with environmental regulations of the contractor, they will be responsibility payment to repair the violation.

## 10. Estimated Budget for EMP Implementation

### 10.1. Implementation of Mitigation Measures by Contractor

The cost for organization, training, dissemination, procurement, operation of equipment, and labor for implementation of mitigation measures in and out of the site in accordance with the EMP and the subproject bidding and contractual document requirements are integrated in the construction package. Contractors will be responsible to study, prepare alternatives and offer cost estimation for these activities. It is considered as one of the criteria for assessing the capability of the Contractor in the future and compliance level of the Contractor.

## 10.2. Supervision of EMP Implementation by CSC

The cost for the CSC to supervise EMP implementation in accordance with the EMP and the subproject bidding and contractual documents is integrated in the contract package with the CSC. Potential bidder for this package will be responsible to study environmental management requirements of the EPC and EMP to prepare and offer cost estimation for EMP supervision during the construction. It is considered as one of the criteria for assessing the capability of the potential CSC in supervising EMP implementation.

## 10.3. EMP Estimated Budget for Independent Environmental Monitoring and Capacity Building

Apart from the costs that have been calculated in relevant packages/contracts the cost for independent environmental monitoring and capacity building is estimated in the table below:

**Table 9. Estimated Budget for Environmental Management Plan**

No	Contents	Cost
1	Cost for Independent Monitoring Consultant	154,350,000
2	Cost for monitoring program implementation	96,565,644
3	Cost for capability building and training	31,000,000
	<b>Sum</b>	<b>281,915,644</b>
4	Contingency (10%)	28,191,564
	<b>Total</b>	<b>310,107,208</b>

Exchange Rate dated on 21 June 2013 of VCB:

$$1\text{USD} = 21,036.00\text{ VND}$$

EMP estimated budget for independent environmental monitoring and capacity building is 310,107,208 VND (14,742 USD). The above cost rate is estimated based on current unit price and Consultant's experiences. Because the project will be implemented several years, price fluctuation will be unavoidable. A contingency amount should be prepared for any unavoidable price or cost increase during project implementation

Detailed costs are described in Appendix 7

## 11. Public consultation and Information disclosure

### 11.1. Objectives

According to the safeguard policy of World Bank (OP 4.01), the subproject shall organize public consultation and disclosure of information on the project to the local communities.

The main objectives of the public consultation and disclosure include:

- Provide information on the subproject to the affected people and local communities.
- Collect opinions and comments of the subproject-affected-people and local communities on the subproject design, location, alternatives, positive and negative potential impacts, and proposed mitigation measures.
- Address concerns of the local communities and people on the subproject and promote active participation of the subproject-affected-people and local communities into the subproject implementation from the early stage of the subproject planning.

## 11.2. Results of public consultation meetings were organized

The project owner (PMU3) has organized a public consultation at Doan Dao communes, Phu Cu district, Hung Yen province.

After listening to the representative of Project owner introducing main item of Project the participants put forward many comment as well as contributions to Project owner, mainly focusing on the issues as follows:

- It needs to have measures to mitigate the impacts during construction stage (e.g. impacts on noise, vibration, dust etc.). Recommends the subproject fully carry out all of mitigation measures that are mentioned in EPC report.
- It needs to timely construct, don't effect on life of people.
- Ensuring the traffic on the NH38B (section Cap bridge) and local road during construction stage.
- The impacts on houses, structures by vibration and construction activities: The local people recommend that the subproject and contractor need to conduct the surveys of structure status before construction. If there are damages in construction stage caused by construction activities, the contractor need to coordinate with local authority and people to overcome.

In additional, the project owner and socio-environmental experts have conducted the interview with 31 households by questionnaire forms.

- Most affected households known information of the project through various sources: from the local authority, from radios and from others.
- Environmental impacts: Almost local people living along the subproject area are affected by noise, vibration caused by the vehicles, not affected by water pollution. Due to large traffic density, the accident usually occurs on this road.
- Positive impact of Project: The project contributes to regional economic development, increasing business opportunities during construction and operation phase.
- Negative impact of Project: Almost interviewed households said that the construction process will affect the socio-economic and natural environment due to dust, noise and vibration generated from machinery. Local people proposed Project side to early deploy and apply measures to minimize the negative impact.
- Mitigation measures of Project: Almost households agree with the mitigation measures which proposed by Project as: spraying water to prevent dust, using canvas cover to prevent dust generated by material transportation. They proposed the project and the construction units should coordinate with the police to regulate the traffic, put the sign under construction.
- Land clearance: The affected peoples want to be fully compensated follow Vietnam policies and safeguard policies of WB to stabilize their life.

In the public consultation meetings and EPC report, the project owner has committed on environmental protection during implementation of the subproject. Specially, the commitments of the project owner as following:

- The project owner has recorded the opinions and comments from local authorities, local communities. Currently, the project owner has directed the consultant of the project research and updates the Project design and the environmental assessment reports.
- About the traffic safety issue: The measures to ensure traffic safety have present in EPC report, the subproject commits following the measures and coordinate with local authorities

to solve the raising issues during project implementing.

- The environmental impacts: the subproject will require contractor must conduct fully the mitigation measures in EPC report and also monitoring implementation process of contractor.
- The issue of social security and order: The subproject commits to carry out fully the environmental protection and social security training to workers. In additional, all of workers and experts of the subproject will be registered temporary residence in local authorities.
- The impacts on houses, structures by vibration and construction activities: The subprojects agree with comments of local people on this issue and will direct the contractor conduct the surveys of structure status before construction.

### **11.3. Disclosure of the EMP**

The EMP in Vietnamese will be disclosed in the country at PMU3, as well as in the Doan Dao commune, Phu Cu district, Hung Yen province.

The EMP copies in Vietnamese and English will be sent to the Vietnam Development Information Center at 63 Ly Thai To street, Hanoi City for disclosure of information. The EMP copies in English will also be disclosed in the Infoshop of the World Bank.

## 12. Appendices

### **Appendix 1. Environmental standard and regulations**

#### *Standards and regulations on water environment*

- QCVN 09: 2008/BTNMT - National technical regulation on underground water quality;
- QCVN 08: 2008/BTNMT - National technical regulation on surface water quality;
- QCVN 14: 2008/BTNMT- National technical regulation on domestic wastewater quality.
- QCVN 40:2011/BTNMT: National Technical Regulation on industrial wastewater.

#### *Standards and regulations on air environment*

- QCVN05:2009/BTNMT. National technical regulation on ambient air quality;
- QCVN06:2009/BTNMT. National technical regulation on hazardous substance in ambient air.

#### *Standards on solid waste*

- QCVN 07:2009/BTNMT The national technical regulation on hazardous waste thresholds;
- TCVN 6707:2009 - Prevention and warning signs for hazardous waste;
- TCVN 6705:2009 - Non-hazardous waste;
- TCVN 6706:2009 - Separation of hazardous wastes.

#### *Standards and regulations on soil environment and sediment*

- QCVN03:2008/BTNMT, National technical regulation on the allowable limits of heavy metals in the soils;
- QCVN 43:2012/BTNMT, National Technical Regulation on Sediment Quality

#### *Standards and regulations on noise and vibration*

- QCVN26:2010/BTNMT, National technical regulation on noise;
- QCVN 27:2010/BTNMT, National technical regulation on vibration.
- TCVN7210:2002, Vibration and shock – Vibration caused by construction works and factories – Maximum permitted levels in the environment of public and residential areas.

#### *Standards on labor sanitation*

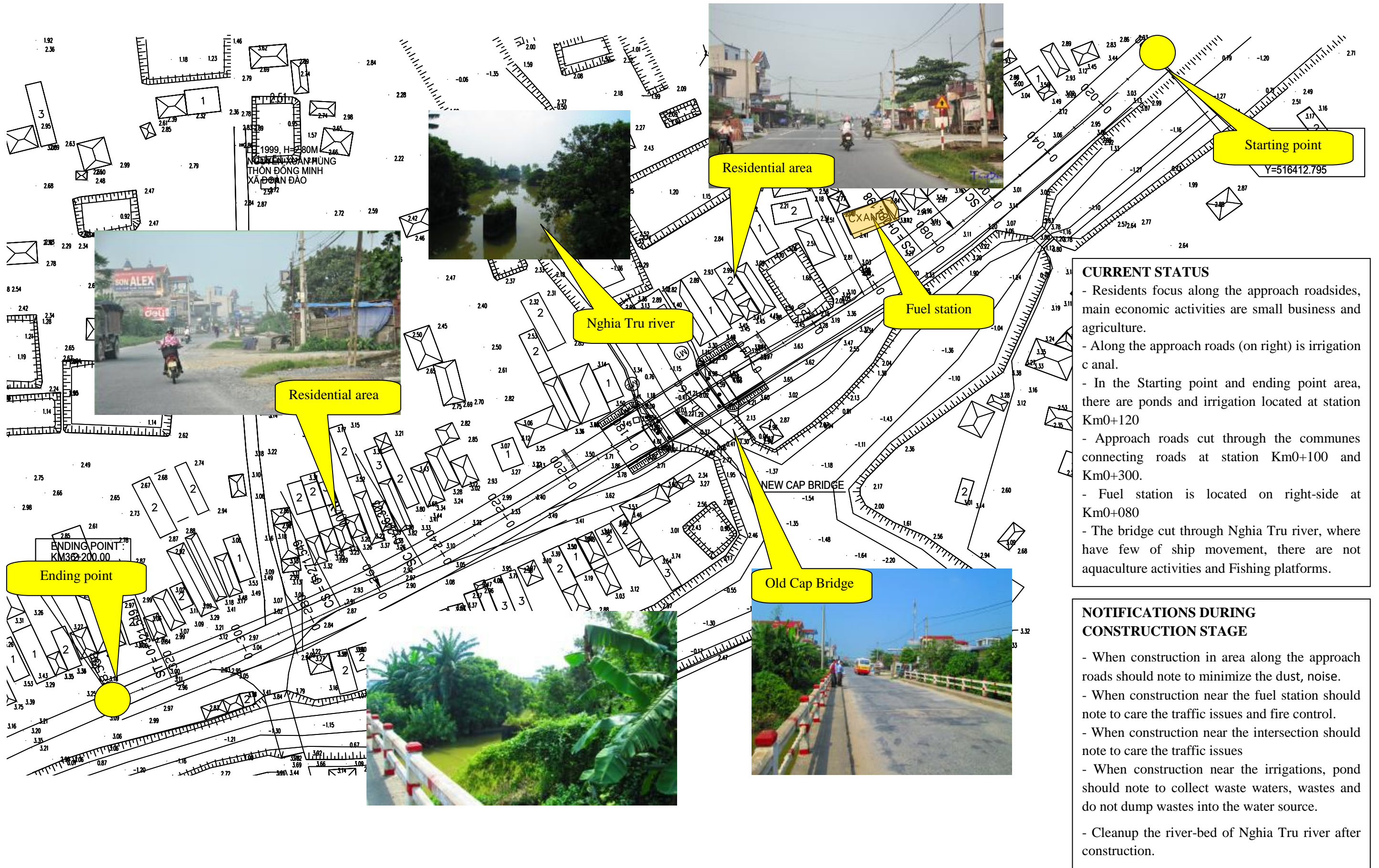
- Decision No. 3733/2002/QĐ-BYT dated 10th October 2002 issued by Health Care Department on application of 21 standards on labor sanitation

#### *Safety standards and regulations for construction;*

- TCVN 5308-1991, TCVN 4086-1995 & TCVN 4244-1986: Safety in construction
- Decision No. 955/1998/QĐ-BLĐTĐBXH: regulations on labour safety



Appendix 2. Specific Impacts, Location and Proposed Mitigation Measures for each Route Segment



**CURRENT STATUS**

- Residents focus along the approach roadsides, main economic activities are small business and agriculture.
- Along the approach roads (on right) is irrigation canal.
- In the Starting point and ending point area, there are ponds and irrigation located at station Km0+120
- Approach roads cut through the communes connecting roads at station Km0+100 and Km0+300.
- Fuel station is located on right-side at Km0+080
- The bridge cut through Nghia Tru river, where have few of ship movement, there are not aquaculture activities and Fishing platforms.

**NOTIFICATIONS DURING CONSTRUCTION STAGE**

- When construction in area along the approach roads should note to minimize the dust, noise.
- When construction near the fuel station should note to care the traffic issues and fire control.
- When construction near the intersection should note to care the traffic issues
- When construction near the irrigations, pond should note to collect waste waters, wastes and do not dump wastes into the water source.
- Cleanup the river-bed of Nghia Tru river after construction.



### **Appendix 3: Environmental and Social Specification for Contractors**

The following are the environmental and social specifications that must be included in both the bidding documents and construction contracts to ensure an adequate management of environmental and social issues during all the phases of the road project. However, this information is intended solely as broad guidance to be used in conjunction with local and national regulations

The Contractor and his employees shall adhere to the mitigation measures set down in:

- The Environmental Management Plan of the Cap bridge project including site specific measures identified in Table 5 and Appendix 2 of EMP;
- The mitigation measures included in project design and bill of quantities;
- The specifications, procedures, and best practices included in these specifications. These specifications complement any technical specifications included in the work quantities and the requirements of any Vietnamese regulations and standards.

#### **WORKFORCE AND SITE MANAGEMENT PLAN**

Workforce

Site installation

Prohibitions

Environmental Training for Construction Workers

#### **CONSTRUCTION IMPACT MANAGEMENT PLAN**

Emissions air and Dust

Noise and Vibration

Earthworks, Cut and Fill Slopes

Disposal of Debris

Bridges

#### **WASTE MANAGEMENT PLAN**

Drainage System

Solid Waste

Hazardous and Chemical waste

#### **MATERIALS HANDLING, USE AND STORAGE MANAGEMENT PLAN**

Transportation

Hazardous Substances

Surfacing Materials

Cement and Concrete Batching

Maintenance of Construction Equipment

#### **SAFETY MANAGEMENT PLAN**

Construction Site Safety

Fire Control

Traffic Management

Environmental Emergency Procedures

**COMMUNITY RELATIONS AND HEALTH MANAGEMENT PLAN**

Community Relations

Health Management Plan

The details of these plans are as follows:

**WORKFORCE AND SITE INSTALLATION MANAGEMENT PLAN**

**Workforce**

Workforce includes all personnel hire by the Contractors to work in the constructions, rehabilitation or improvement of roads. The workers shall, whenever possible, rent houses nearby.

The Contractors shall:

- Give priority to hire local labor for the works;
- Engineers and workers shall register their temporary residence with the local authority;
- Provide work safety training to those local labors upon their hiring;
- The construction workers and staff shall need to have appropriate certificates as required (for example, health checks, labor contracts, insurance, etc);
- Provide education classes on HIV and sexually transmitted diseases.
- Establish a Code of Conduct to outline the importance of appropriate behavior, drug and alcohol abuse, respect for local communities, and compliance with relevant laws and regulations. Each employee shall be informed of The Code of Conduct and bound by it while in the employment of the PMU3 or its Contractors;
- The Code of Conduct shall address issues such as the prohibition to possess illegal substances, fire arms, pornographic materials, gambling, disturbances in or near communities, etc. Failure to follow the Code of Conduct should result in disciplinary actions;
- Ensure adequate use of resources and proper waste management.

**Site Installation**

In order to minimize adverse environmental impacts due to construction and location of areas/facilities for the complexion of the project, the following measures should be put into place:

- To the extent possible, the project shall utilize the existing mixing stations and asphalt plants of local area;
- The workforce shall be provided with safe, suitable and comfortable accommodations. They have to be maintained in clean and sanitary conditions;
- A medical and first aid facilities and first aid boxes shall be provided for all workers.

**Prohibitions**

The following activities are prohibited on or near the project site:

- Cutting of trees for any reason outside the approved construction area;

- Use of unapproved toxic materials, including lead-based paints, asbestos, etc.;
- Disturbance to anything with architectural or historical value;
- Building of fires;
- Use of firearms (except authorized security guards);
- Use of alcohol by workers in office hours;
- Washing cars or machinery in streams or creeks;
- Doing maintenance (change of oils and filters) of cars and equipment outside authorized areas:
- Disposing trash in unauthorized places;
- Driving in an unsafe manner in local roads;
- Working without safety equipment (including boots and helmets);
- Creating nuisances and disturbances in or near communities;
- The use of rivers and streams for washing clothes;
- Indiscriminate disposal of rubbish or construction wastes or rubble;
- Littering the site;
- Spillage of potential pollutants, such as petroleum products;
- Collection of firewood;
- Poaching of any description;
- Explosive and chemical fishing;
- Burning of wastes and/or cleared vegetation.

Any construction worker, office staff, Contractor's employees, the PMU3's employees or any other person related to the project found violating these prohibitions will be subject to disciplinary actions that can range from a simple reprimand to termination of his/her employment depending on the seriousness of the violation.

### **Environmental Training for Construction Workers**

The Contractor shall prepare an Environmental Training Plan for all construction workers and staff to ensure that all concerned staff is aware of the relevant environmental requirements as stipulated in the Vietnamese environmental legislation and the Contract specifications.

- The Contractor shall distribute to the key staff, including newly joined key staff members, (1) the Contractor's Environmental Policy; and (2) Copies of relevant extracts from environmental laws, standards and regulations.
- The Contractor is responsible for providing appropriate training to all staff according to their level of responsibility for environmental matters. Managerial staff shall receive additional training.
- All Contractor's employees shall be required to comply with environmental protection procedures and they shall be able to provide evidence that they attended the training sessions detailed in the Plan;
- Training materials and methods - which shall include formal training sessions, posters, data in newsletters, signs in construction area and 'tool box' meetings - shall

be reviewed by the SES and submitted to the EO for approval.

- The Plan shall educate all construction workers on the following issues but not limited to them: fire arm possession, traffic regulations, illegal logging and collection of non-timber forestry products, non-disturbance of resettlement communities, hunting and fishing restrictions, waste management, erosion control, health and safety issues, all prohibited activities, the Code of Conduct requirements and disciplinary procedures, general information on the environment in which they will be working and living; and establishment of penalties for those who violate the rules;
- Periodic training shall be provided when necessary.
- Records shall be maintained (e.g. attendance records for environmental awareness training, topics covered) and submitted to the PMU3 upon request.

## **CONSTRUCTION IMPACT MANAGEMENT PLAN**

### **Emissions and Dust**

In order to ensure that the generation of dust due to the constructions activities is minimized, the following activities should be put into place:

- The Contractor shall be responsible for compliance with relevant Vietnamese legislation with respect to ambient air quality;
- The Contractor shall ensure that the generation of dust is minimized and shall implement a dust control program to maintain a safe working environment, minimize nuisance for surrounding residential areas / dwellings and protect damage to natural vegetation, crops, etc;
- The Contractor shall implement dust suppression measures (e.g. water spray vehicles, covering of material stockpiles, etc.) if and when required;
- Construction vehicles shall comply with speed limits and haul distances shall be minimized;
- It is encouraged to use vehicles and machinery which would cause less pollution like gasoline without lead. Limit the use of materials which may have high risk of pollution such as coal and black oil;
- Transport and construction vehicles shall abide by the Standard TCVN 6438-2005 with respect to maximum exhaust fumes allowed;
- Material loads shall be suitably covered and secured during transportation to prevent the scattering of soil, sand, materials or dust.

### **Noise and Vibration**

To minimize noise and vibration during construction, the Contractor shall:

- Be responsible for compliance with the relevant Vietnamese legislation with respect to noise;
- Ensure that all instruments, machinery and construction equipment meet quality standards before they are put into use;
- Try to keep noise generating activities to a minimum;
- Restrict all operations that result in undue noise disturbance to local communities and/or dwellings to daylight hours on weekdays or as agreed with the Environmental Officer of PMU3;

- Use temporary noise barriers to minimize the noise caused by the construction equipment;
- Provide ear pieces to workers who must work with highly noisy machines such as piling, explosion, mixing, etc., for noise control and workers protection
- Maintain the construction equipment in its best operating conditions and lowest noise levels possible;
- In sensitive areas (including residential neighborhoods, hospitals, rest homes, schools, etc.) more strict measures may need to be implemented to prevent undesirable noise levels;
- To the extent possible, nighttime operations shall be kept to a minimum and banned near sensitive receptors;

### **Earthworks, Cuts and Fill Slopes**

Earthworks, cuts and fill slopes shall be carefully managed to minimize negative impacts on the environment

- All earthworks shall be properly controlled, especially during the rainy season.
- The Contractor shall maintain stable cut and fill slopes at all times and cause the least possible disturbance to areas outside the prescribed limits of the works.
- Any excavated cut or unsuitable material shall be disposed of in designated disposal areas as agreed to by the EO.
- Disposal sites should not be located where they can cause future slides, interfere with agricultural land or any other properties, or cause soil from the dump to be washed into any watercourse. Drains may need to be dug within and around the tips, as directed by the SEO or SES and to the satisfaction of the EO.

### **Disposal of Debris**

The Contractor shall carry out the following activities:

- Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for debris;
- Debris generated due to the dismantling of existing structures shall be suitably reused, to the extent feasible, in the proposed rehabilitation program. The disposal of remaining debris shall be carried out only at sites identified and approved by the EO. The contractor should ensure that these sites (a) are not located within designated forest or cultivated areas; (b) do not impact natural drainage courses; and (c) do not impact endangered/rare flora. Under no circumstances shall the contractor dispose of any material in environmentally sensitive areas.
- In the event any debris or silt from the sites is deposited on adjacent land, the Contractor shall immediately remove such, debris or silt and restore the affected area to its original state to the satisfaction of the EO.
- Water courses shall be cleared of debris and drains and culverts checked for clear flow paths;
- Include provisions for incorporating the most appropriate stabilization techniques for each disposal site and determine that the selected spoil disposal sites do not cause unwanted surface drainage;
- Assess risk of any potential impact regarding leaching of spoil material on surface water;

- Once the job is completed, all rehabilitation -generated debris should be removed from the site.

### **Bridges**

- The Contractor shall submit a bridge method statement to the EO for approval, detailing the location of the temporary bypasses, spill prevention measures, and sedimentation control measures, surface water flow diversion, reinstatement, etc;
- After bridge construction, the works area, stream diversion, settlement pond areas and temporary bypasses shall be reinstated to the satisfaction of the EO and SES.

## **WASTE MANAGEMENT PLAN**

During the construction stage, the Contractor shall prepare a Waste Management Plan before commencement of project works. The Plan shall include the following Sub-Plans:

### **Wastewater**

- The Contractor shall be responsible for compliance with the relevant Vietnamese legislation relevant to wastewater discharges into watercourses
- The Contractor shall submit a method statement to the EO detailing how wastewater would be collected from all wastewater generating areas, as well as storage and disposal methods. If the Contractor intends to carry out any on-site wastewater treatment, this should also be included;
- Water from kitchens, showers, laboratories, sinks etc. shall be discharged to existing sewer system (if any) or a conservancy tank for removal from the site;
- Runoff from fuel depots/workshops/machinery washing areas and concrete batching areas shall be collected into a conservancy tank and disposed of at a site approved by the EO or SES;
- Domestic sewage from site office and toilets shall either be collected by a licensed waste collector or treated by on-site treatment facilities. Discharge of treated wastewater must comply with the discharge limit according to the legislation;
- Toilets can be provided on site for construction workers. Domestic sewage collected from the site office and chemical toilets shall be cleaned up on regular basis. Only licensed waste collectors shall be employed for this disposal;
- Wastewater shall not be disposed in watercourses without treatment.

### **Solid waste**

- The Contractor shall submit a method statement detailing a solid waste control system to the EO for approval.
- The Contractor shall ensure that all facilities are maintained in a neat and tidy condition and the site shall be kept free of litter;
- Measures shall be taken to reduce the potential for litter and negligent behavior with regard to the disposal of all refuse. At all places of work, the Contractor shall provide litter bins, containers and refuse collection facilities for later disposal;
- Solid waste may be temporarily stored on site in a designated area approved by the EO prior to collection and disposal as regulation.
- No burning, on-site burying or dumping of waste shall occur;
- Random disposal of solid waste in scenery areas shall be strictly prohibited.

### **Hazardous waste**

- All hazardous waste shall be disposed of at an approved hazardous landfill site and in accordance with local legislative requirements. The Contractor shall provide disposal certificates to the EO;
- The removal of asbestos-containing materials or other toxic substances shall be performed and disposed of by specially trained workers;
- Used oil and grease shall be removed from site and sold to an approved used oil recycling company;
- Under no circumstances shall the spoiling of tar or bituminous products be allowed on the site, over embankments or any burying;
- Unused or rejected tar or bituminous products shall be returned to the supplier's production plant;
- Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery shall be collected in holding tanks and sent back to the supplier or removed from site by a specialist oil recycling company for disposal at an approved hazardous waste site.
- Inform the EO of any accidental spill or incident;
- Initiate a remedial action following any spill or incident;
- Provide a report explaining the reasons for the spill or incident, remedial action taken, consequences/damage from the spill, and proposed corrective actions.

### **MATERIALS HANDLING, USE AND STORAGE MANAGEMENT PLAN**

Environmental considerations shall be taken into account in the location of any material storage areas.

#### **Transportation**

- The Contractor shall ensure that all suppliers and their delivery drivers are aware of procedures and restrictions (e.g. restricted areas);
- Material shall be appropriately secured to ensure safe passage between destinations during transportation;
- Loads shall have appropriate cover to prevent them spilling from the vehicle during transit;
- The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

#### **Hazardous Substances**

The Contractor shall provide a method statement detailing the hazardous substances / material that are to be used during construction, as well as the storage, handling, and disposal procedures for each substance / material and emergency procedures in the event of misuse or spillage that might negatively affect the environment. In general terms, the following activities shall be carried out:

- Make the Hazardous Waste Management Plan available to all persons involved in operations and transport activities
- All hazardous material / substances shall be stored on site only under controlled conditions;

- All hazardous material / substances shall be stored in a secured, appointed area that is fenced and has restricted entry. All storage shall take place using suitable containers to the approval of the EO;
- Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure;
- Fuel shall be stored in a steel tank supplied and maintained by the fuel suppliers. The tank shall be located in a secure, demarcated area.

### **Surfacing Materials**

- Over spray of bitumen products outside of the road surface and onto roadside vegetation shall be prevented using a method approved by the SES;
- When heating of bitumen products, the Contractor shall take appropriate fire control measures; Stone chip / gravel excess shall not be left on road / paved area verges. This shall be swept /raked into piles and removed to an area approved by the SES;
- Water quality from runoff from any fresh bitumen surfaces shall be monitored by the SES and remedial actions taken where necessary.

### **Cement and Concrete Batching**

- Concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces to the satisfaction of the SES;
- All runoff from batching areas shall be strictly controlled, and cement-contaminated water shall be collected, stored and disposed of at a site approved by the SES;
- Unused cement bags shall be stored out of the rain where runoff won't affect it;
- Used (empty) cement bags shall be collected and stored in weatherproof containers to prevent windblown cement dust and water contamination. Used cement bags shall not be used for any other purpose and shall be disposed of on a regular basis via the solid waste management system;
- All excess concrete shall be removed from site on completion of concrete works and disposed of washing of the excess into the ground is not allowed. All excess aggregate shall also be removed.

### **Maintenance of Construction Equipment**

The Contractor shall:

- Identify and demarcate equipment maintenance areas (>15m from rivers, streams, lakes or wetlands). Fuel storage shall be located in proper areas and approved by the EO;
- Ensure that all instruments, machines, and construction equipment meet quality standards before they are put into use;
- Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas; never dispose spent oils on the ground, in water courses, drainage canals or in sewer systems.
- All spills and collected petroleum products shall be disposed of in accordance with standard environmental procedures/guidelines. Fuel storage and refilling areas shall be located at least 300m from all cross drainage structures and important water bodies or as directed by the EO.



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## **SAFETY MANAGEMENT PLAN**

### **Construction Site Safety**

The Contractor's responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

- Provide personal protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed boots, etc.) for construction workers and enforce their use;
- During heavy rains, accidents, or emergencies of any kind, suspend all work;
- Brace electrical and mechanical equipment to withstand seismic events during the construction;
- Limit the speed of vehicles moving within the construction site;
- Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning. All signs shall be constructed according to Vietnamese specifications;
- Provide post Material Safety Data Sheets for each chemical present on the worksite;
- Require that all workers read, or are read, all Material Safety Data Sheets. Clearly explain the risks to them and their partners, especially when pregnant or planning to start a family. Encourage workers to share the information with their physicians, when relevant;
- Ensure that the removal of asbestos-containing materials or other toxic substances be performed and disposed of by specially trained workers;

### **Fire Control**

- The Contractor shall submit a fire control and fire emergency method statement to the EO for approval. The method statement shall detail the procedures to be followed in the event of fire;
- The contractor shall take all reasonable steps to avoid increasing the risk of fire through activities on site;
- The contractor shall appoint a fire officer who shall be responsible for ensuring immediate and appropriate action in the event of a fire;
- The contractor shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire;
- Any work that requires the use of fire may only take place at a designated area approved by the EO and must be supervised at all times. Fire-fighting equipment shall be available.

### **Traffic Management**

The Contractor shall:

- Estimate maximum concentration of traffic (number of vehicles/hour);
- Construction vehicles shall comply with speed limits;
- Use selected routes to the project site, as agreed with the EO, and appropriately sized vehicles suitable to the class of roads in the area, and restrict loads to prevent damage

to local roads and bridges used for transportation purposes;

- Maintain adequate traffic control measures throughout the duration of the construction activities and such measures shall be subject to prior approval of the EO;
- Promote and disseminate traffic safety information to local residents;
- If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours;
- Ensure traffic safety at intersections, especially near sensitive areas (schools, markets, hospitals, and historical, cultural and religious places).
- Maintain a supply for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction;
- Use signs and flagmen for traffic control;
- Materials leaving or entering the construction site shall be transported during non-peak hours in order to minimize traffic noise due to the increase in traffic volume;

### **Environmental Emergency Procedures**

Environmental Emergency procedures are unforeseen events that can occur during the construction or rehabilitation of a road. The Contractor shall be prepared to take any necessary measures to solve such emergencies on a case-by-case basis. Events related to adverse weather conditions shall be addressed as part of the Contractor's Safety Plan, which shall be submitted to the EO before commencement of project construction works.

The following environmental emergency procedures shall be implemented during the construction of the Road:

- Training shall be provided to all construction workers and site staff to ensure that they are fully aware of the various possible emergency situations in construction activities, the danger and potential damages caused by the emergency to the environment and the people, as well as the emergency response procedures to be followed;
- If explosive materials are detected during the clearing of construction areas, earthwork movements, or any other construction activity, the Contractor shall secure the area and inform the local authorities immediately, which in turn shall contact the local army unit for support;
- If a person identifies a leakage/spillage, she/he shall immediately check if anyone is injured and shall then inform the Contractor, the SEO and SES;
- The Contractor shall ensure any injured persons are treated and assess what has been spilled/leaked;
- If the accidents/incidents generate serious environmental pollution or the SEO or the SES consider that the incident has the potential of resulting in serious environmental pollution problems (eg. spillage/leakage of toxic or chemicals, large scale spillage/leakage, or spillage/leakage into the nearby water bodies which are used for irrigation/portable water), the SES or SEO shall inform the EO immediately.
- In such cases, the Contractor shall take immediate action to stop the spillage / leakage and divert the spilled / leaked liquid to a nearby non-sensitive areas;
- The Contractor shall arrange maintenance staff with appropriate protective clothing to clean up the chemicals/chemical waste. This may be achieved through soaking

with sawdust (if the quantity of spillage/leakage is small), or sand bags (if the quantity is large); and/or using a shovel to remove the topsoil (if the spillage/leakage occurs on bare ground); and

- Depending on the nature and extent of the chemical spill, evacuation of the activity site may be necessary.
- Spilled chemicals must not be flushed to local surface drainage systems. Instead, sawdust or sandbags used for clean-up and removed contaminated soil shall be disposed of by following the procedures for chemical waste handling and disposal already described.
- The Contractor(s) shall prepare and present a report to the EO on the incident detailing the accident, clean-up actions taken, any pollution problems and suggested measures to prevent similar accidents from happening again in future.

## **COMMUNITY RELATIONS AND HEALTH MANAGEMENT PLAN**

### **Community Relations**

The Contractor shall:

- Maintain open communications between the local government and concerned communities;
- Have a mailing list to include agencies, organization, and residents that are interest in the project;
- Disseminate project information to affected parties through community meetings before construction commencement;
- Provide a community relations contact from whom interested parties can receive information on site activities, project status and project implementation results;
- Provide all information, especially technical findings, in a language that is understandable to the general public and in a form of useful to interested citizens and elected officials through the preparation of fact sheets and news release, when major findings become available during project phase;
- Monitor community concerns and information requirements as the project progresses;
- Respond to telephone inquiries and written correspondence in a timely and accurate manner;
- Inform local residents about construction and work schedules, interruption of services, traffic detour routes and provisional as appropriate;
- Provide technical documents and drawings to PC's community, especially a sketch of the construction area and the EMP of the construction site;
- Notification boards shall be erected at all construction sites providing information about the project, as well as contact information about the site managers, environmental staff, health and safety staff, telephone numbers and other contact information so that any affected people can have the channel to voice their concerns and suggestions;
- Limit construction activities at night. When necessary ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures.

### **Health Management Plan**

The Contractor shall prepare and enforce a Health Management Plan to address matters regarding the health and wellbeing of construction workers, project staff and nearby communities. The Contractor shall include in his proposal the outline of the Health Plan. The EO will issue a certificate of compliance to the Contractor prior to the initiation of Construction. The Contractor shall:

- Require screening of all workers on recruitment and annually;
- Implement a vaccination program including but not limited to vaccination against yellow fever, hepatitis A and B, tetanus, polio, etc.
- Provide periodical health check to construction workers to ensure their health and well being.
- Provide appropriate information and education to the workforce on basic personal hygiene, prevention of diseases, including respiratory diseases, vector-borne diseases such as malaria and dengue, water and food borne diseases such as diarrhea, tuberculosis, etc;
- Implement a program for workers and local communities, via an approved service provider, for the prevention, detection, screening, and diagnosis of sexually transmitted diseases, especially with regard to HIV/AIDS;
- Implement preventive measures against malaria, if applicable.
- Provide basic first aid services to the workers as well as emergency facilities for emergencies for work related accidents including a medical equipment suitable for the personnel, type of operation, and the degree of treatment likely to be required prior to transportation to hospital;
- Include a Pest Management Program for the construction areas, including construction work areas, in the Health Management Plan. The use of pesticides shall follow procedures acceptable to the World Bank and the government of Viet Nam;
- Ensure correct maintenance of water sources to prevent the breeding of mosquitoes.

## **Appendix 4: Environmental Supervision for the Construction of the Cap Bridge project**

**(to be included in the scope of works for the Construction Supervision Consultant)**

### **General**

In order to prevent harm and nuisances on local communities, and to minimize the impacts on the environment during the construction and operation of Cap Bridge project, the following documents have been prepared which should be adhered to by all Contractors and his employees:

- The Environmental Protection Commitment (EPC) for Cap Bridge project;
- The Environmental Management Plan (EMP) of Cap Bridge project including site specific measures identified in Table 5 and Appendix 2 of the EMP;
- The mitigation measures included in project design and bill of quantities;
- The specifications, procedures, and best practices included in the EMP. These specifications complement any technical specifications included in the work quantities and the requirements of any Vietnamese regulations and standards;

### **Objective of the Assignment**

The Consultant is to provide professional technical services (“the Services”) to help ensure effective implementation of the Environmental Management Plan (EMP), mitigation measures included in the Information Page, and the Environmental Specifications during the construction of Cap Bridge project.

In order to achieve the goal of minimizing the negative environmental impacts of the project, the EMP has been integrated in the design of the Road, and in the technical specifications and contract documents. It will need to be closely followed and implemented by the contractors. The implementation of the EMP will therefore involve three parties:

- The Contractor’s Workplace Safety and Environment Officer (SEO) responsible for implementing the EMP and other construction related environmental and safety issues;
- The Construction Supervision Consultant (CSC) who are responsible for supervising and monitoring all construction activities and for ensuring that contractors comply with the requirements of the contracts and the EMP. The CSC will include Environmental Engineers led by a Workplace Safety and Environment Supervisor (SES).

### **Scope of Services:**

The general services to be provided by the SES are to inspect, monitor and audit the construction activities to ensure that mitigation measures adopted in the EMP are properly implemented, and that the negative environmental impacts of the project are minimized.

The Contractor has the responsibility for ensuring compliance with the project EMP and contract conditions while undertaking the works. This is overseen by the SES. The SES is therefore to be an independent monitor to ensure compliance with the EMP and to ensure adequate performance of the Contractors on environmental issues.

The SES will inspect, monitor and carry out environmental review of all road and bridge contracts packages and lots. The SES shall have extensive knowledge and experience in environmental supervision, monitoring and auditing to provide independent, objective and professional advice to the client on the environmental performance of the project. The SES team leader shall be familiar with the project works through review of the relevant reports, including the EPC, EMP as well as project technical specifications and contract documents.

As part of the CSC, the SES is expected to perform the following duties:

***Phase I: Preparation***

The objective of Phase I is to lay the groundwork for the successful execution of the project. In this phase, the SES shall: (i) review the EPC, EMP, project designs and technical specifications and confirm that there have been no major omissions of mitigation measures; (ii) prepare guides for contractors on implementing the EMP; and, (iv) develop and execute a training program for all involved in construction activities.

The main tasks in this phase are:

**Review of Project Documents:** The SES shall review the EPC, EMP, project designs and technical specifications and confirm in writing that there have been no major omissions of mitigation measures. If any issues are identified, the SES shall propose to the PMU3 updates to the EMP and the design and technical specifications to address these issues. Once approved by PMU, the SES shall update the EMP.

**Environmental Supervision Checklist:** The SES shall establish a comprehensive checklist which will be used during the construction of the project to monitor the contractor's performance. This shall cover major aspects of the project, required mitigation/control measures and their implementation schedule.

**Log-Book:** The SES shall keep a log-book of each and every circumstance or change of circumstances which may affect the environmental impact assessment and non-compliance with the recommendations made by the SES to remediate the non-compliance. The log-book shall be kept readily available for inspection by all persons assisting in the supervision of the implementation of the recommendations of the EPC and Contract. The CSC shall verify the log-book as part of his environmental audit.

**Environmental Training:** The SES shall design and execute a comprehensive training program for all actors: Supervision Engineers, EO of PMU3, PMU3, Contractor's SEOs (and workers as part of the trainings given to the SEO), on the environmental requirements of the project, and how they will be supervised, monitored and audited, giving particular attention to:

- EMP: The requirements of the EMP, the agreed environmental monitoring checklist, the environmental monitoring form, how non-compliance with the EMP will be handled, and all other key issues shall be covered. Particular attention will be paid to the specific provisions in each contract's technical specifications indicating how the EMP is to be complied with;
- Health and Safety: The health and safety requirements of the project shall be clearly identified and communicated with the Contractors and PMU3 (included in environmental specifications for contractors).

At the conclusion of the training Contractors will also sign a statement acknowledging their awareness of the environmental regulations, the EMP, the compliance framework, and health and safety obligations. The CSC shall sign a similar statement confirming their understanding of the supervision responsibilities.

***Phase II: Supervision of Construction Activities***

On behalf of the PMU3 and the Chief Supervision Engineer, the SES will:

- Review, and inspect in an independent, objective and professional manner in all aspects of the implementation of the EMP;
- Carry out random monitoring checks, and review on records prepared by the Contractor's SEO;

- Conduct regular site inspections;
- Review the status of implementation of environmental protection measures against the EMP and contract documents;
- Review the effectiveness of environmental mitigation measures and project environmental performance;
- As needed, review the environmental acceptability of the construction methodology (both temporary and permanent works), relevant design plans and submissions. Where necessary, the SES shall seek and recommend the least environmental impact alternative in consultation with the designer, the Contractor(s), and PMU3:
- Verify the investigation results of any non-compliance of the environmental quality performance and the effectiveness of corrective measures; and
- Provide regular feedback audit results to PMU3 and CSC according to the procedures of non-compliance in the EMP;
- Provide training programs, including CSC and PMU3 staff, to appraise them of issues identified and how to improve environmental compliance;
- Instruct the Contractor(s) to take remedial actions within a specified timeframe, and carry out additional monitoring, if required, according to the contractual requirements and procedures in the event of non-compliances or complaints;
- Instruct the Contractor(s) to take actions to reduce impacts and follow the required EMP procedures in case of non-compliance / discrepancies identified;
- Instruct the Contractor(s) to stop activities which generate adverse impacts, and/or when the Contractor(s) fails to implement the EMP requirements / remedial actions instructed by the SES.

**Review of Site Plans:** To ensure consistency across the project, the SES shall provide the final review of all site plans which may affect the environment. These include, but are not limited to: borrow pit and disposal sites plans. The SES will review and approve the EMP Implementation Plan and Landscape Implementation Plan presented by the Contractors. Where these plans are found not to comply with the EMP, EPC, the SES shall work with the CSC and Contractor to establish a suitable solution.

**Health and Safety:** To ensure consistency across the project, the SES shall provide the final review and recommend clearance of all Contractors' Safety Plans, and, based on these, with inputs from the CSC, Contractor shall prepare an overall Subproject Safety Plan (PSP). The PSP shall include procedures such as management of explosions, safety during construction, the prevention of slope slide / soil erosion during the rainfall season, etc. These plans shall be reviewed on an annual basis and updated if necessary.

The SES shall ensure compliance with the requirements of the health and safety clauses in the contract documents. This shall include, but not be limited to: (i) construction activities; (ii) HIV/AIDS education campaign; (iii) compliance with Viet Nam's labor laws; and (iv) road traffic safety. For HIV/AIDS the focus shall not only be on the construction sites themselves, but also on assisting the nearby communities.

**Site Inspections:** The SES shall closely audit the construction activities through regular site inspections accomplished through daily site visits, walks and visual inspections to identify areas of potential environmental problems and concerns.

Inspections should be done independently from the Contractor's staff. It is expected that the SES shall have their own hand held and portable monitoring equipment such as cameras, transport and other resources. Where definitive monitoring is necessary to resolve

contentious issues or to impose penalties, the SES may contract third parties to carry out specific monitoring at the locations under review.

Where there is infringement of technical specifications, or condition of contracts, or non compliance with the EMP, the SES shall be immediately inform Contractor's Chief Engineer, Supervision Chief Engineer and PMU3. The SES shall also report all infringements to the PMU3 as part of the monthly reporting.

Regular joint environmental site inspections (e.g. weekly) should be organized by the SES and CSC, with participation from the Contractor's Environmental Officer (SEO). These should be used as an opportunity for the SES to further train the CSC and Contractor's staff.

SES field engineer's log-book shall be kept readily available for inspection by all persons assisting in project management.

The SES shall also regularly review the records of the contractors to ensure that they are up to date, factual and meet the EMP reporting requirements (e.g. environmental complaint monitoring records).

**Complaints:** Complaints will be received by the Contractor's Site Office from local residents with regard to environmental infractions such as noise, dust, traffic safety, etc. The Contractor's Chief Engineer or his deputy, and the SEO shall be responsible for processing, addressing or reaching solutions for complaints brought to them. The SES shall be provided with a copy of these complaints and shall confirm that they are properly addressed by the Contractors in the same manner as incidents identified during site inspections.

**Unforeseen Impacts:** In the event that an incident arises which was not foreseen in the EMP or EPC, the SES shall work closely with the CSC, the Contractors, and the PMU3 to confirm satisfactory resolution to the incident. The SES shall then update the EMP and the implementation guidelines, training the Contractors' staff accordingly.

**Monthly Payments:** The SES shall confirm the monthly payments for environmentally related activities as recommended by the SES to the client.

**Site Restoration and Landscaping:** The SES shall closely monitor all activities with regard to site restoration and landscaping in areas such as borrow pits, quarries, washing vehicles etc. to ensure that the activities are done to an appropriate and acceptable standard. The SES will agree with the Contractor on a Site Decommissioning and Restoration plan to be implemented before the completion of the construction.

**Project Initiation and Staffing:** It is anticipated that the CSC and the SES, will be mobilized one month before the start of the construction activities. The one month start up time will be utilized by the SES to review and familiarize itself with the project, the project design, the technical specifications, contract documents, the EPC, EMP reports and other project relevant documents and reports. Following the review, the SES will prepare a brief report on the potential issues and challenges arising from the implementation of the EMP and the condition of contracts and make recommendations to the PMU3 about how best to improve the implementation of the EMP.

The SES is expected to be mobilized at the beginning of the contract, to prepare the necessary guidelines, documentation, training, etc.

Reporting: As a minimum the SES shall prepare the following written reports:

- Weekly report of non-compliance issues
- Summary monthly report covering key issues and findings from reviewing and supervision activities



- Consolidated summary report from contractor's monthly report

They shall also collect and report on data as requested by the PMU3.

At the end of the project the SES shall prepare a final report summarizing the key findings from their work, the number of infringements, resolutions, etc. as well as advice and guidance for how such assignments should be conducted in the future.

## **Appendix 5 Independent environmental monitoring consultant (IEMC)**

### Objective of the assignment

The Independent Environmental Monitoring Consultant (IEMC) will be contracted to provide professional services (“the Services”) regarding environmental sampling, and reviewing compliance to the Environmental Management Plan (EMP) and the Environmental Specifications of the Project. IEMC shall provide support to PMU3 to establish and operate environmental management systems, offers suggestions for adjusting and building capacity for relevant agencies during the implementation period and monitor the Contractor’s EMP implementation plan in both construction and operation stages. IEMC will also be responsible to support PMU3 to prepare monitoring reports on EMP implementation and submit these reports to DONRE for approval.

Through this assignment, the effectiveness of the mitigation measures and reporting procedures will be verified, or recommendations shall be made regarding alteration of construction method or additional mitigation measures to make sure that the potential negative impacts related to the construction of the bridge are minimized.

### Institutional Arrangements for EMP implementation

In order to achieve the goal of minimizing the negative environmental impacts of the project, the EMP has been integrated in the design of the Road, and in the technical specifications and contract documents. It will need to be closely followed and implemented by the Contractors. The implementation of the EMP will therefore involve three parties:

- The Contractor’s **Workplace Safety and Environment Officer (SEO)** responsible for implementing the EMP and other construction related environmental and safety issues.
- The **Construction Supervision Consultant (CSC)** who are responsible for supervising and monitoring all construction activities and for ensuring that contractors comply with the requirements of the contracts and the EMP. The CSC will include a **Workplace Safety and Environment Supervisor (SES)**; and,
- A Client’s **Independent Environmental Monitoring Consultant (IEMC)**, who carry out environmental sampling and monitoring activities specified in this TOR.

### Scope of services

The IEMC shall carry out monitoring twice a year, on all environmental-related issues regarding the contractor’s works. The IEMC will carry out field sampling, monitoring and check, review, verify and validate the overall environmental performance of the project through regular inspections and review. This review will provide confirmation that the reported results are valid and that the relevant mitigation measures and monitoring program provided in the Project EMP are fully complied with. They will also supply specialized assistance to the client in environmental matters. IEMC’s specific tasks will include, but not limited to, the followings:

#### **Task I: Environmental Sampling Monitoring**

The IEMC shall carry out sampling and monitoring of environmental quality with parameters and frequency specified in table 7 (see “Environmental Monitoring Requirements”)

#### **Task II: Review and Assess Compliance to EMP by PMU, CSC, SES and the Contractor**

The IEMC shall review and evaluate the environmental performance and compliance of

EMP by PMU, CSC, SES and the Contractor from design to construction phases. The IEMC shall also assess the effectiveness of the mitigation measures to be implemented and the effectiveness of the reporting procedures. The review and evaluation should cover, but not limited to the followings:

**Desk Review:** The IEMC shall review the completeness of the environmental records, reports and documents prepared by the PMU3, CSC, SES and the Contractor related to:

- Review the activities carried out and the records and documents created, updated, or maintained by the CSC;
- Allocation of staff as an SES;
- Written confirmation that there have been no major omissions of mitigation measures, or proposals on the updates to the EMP and the design and technical specifications to address these issues;
- The checklist developed for use during the construction of the project to monitor the contractor's performance;
- A log-book of each and every circumstance or change of circumstances which may affect the environmental impact assessment and non-compliance with the recommendations made by the SES to remediate the non-compliance;
- Records on the design and training program for Supervision Engineers, Contractors, PMU3 staff, and workers;
- Records on day-to-day supervision carried out by the SES, such as:
  - a. Review and inspect all aspects of the implementation of the EMP;
  - b. Random monitoring, check and review on records prepared by the Contractor's SEO;
  - c. Regular site inspections;
  - d. Review the status of implementation of environmental protection measures against the EMP and contract documents;
  - e. Review the effectiveness of environmental mitigation measures and project environmental performance;
  - f. Review the environmental acceptability of the construction methodology (both temporary and permanent works), relevant design plans and submissions, if applicable;
  - g. Verification on the investigation results of any non-compliance of the environmental quality performance and the effectiveness of corrective measures;
  - h. Feedback review results to the PMU3 and CSC according to the procedures of non-compliance in the EMP;
  - i. Review and recommendations for all site plans prepared by the Contractor;
  - j. Monitoring of all activities with regard to site restoration and landscaping;
  - k. Confirmation on proper address of complaints by the Contractor and/or PMU;
  - l. Proof of coordination between the SES and the CSC, the Contractors, and the PMU3 to confirm satisfactory resolution to the unforeseen impacts
- Review the activities carried out and the records and documents created, updated, or maintained by the Contractor or his SEO:
  - a. Records and documents prepared for training on environmental awareness for the

contractor's workers.

- b. Site surveillance to investigate the Contractors' site practice, equipment and work methodologies with respect to pollution control and adequacy of environmental mitigation measures implemented;
  - c. Monitor the implementation of environmental mitigation measures and the Contractor's compliance with environmental protection, pollution prevention and control measures, and contractual requirements;
  - d. Advice to the Contractor(s) on environment improvement, awareness, proactive pollution prevention measures;
  - e. Investigation and proposals on mitigation measures to the Contractor(s) in the case of non-compliance / discrepancies, if applicable;
  - f. Proof of participation in the monitoring and implementation of remedial measures to reduce environmental impact;
  - g. Review the success of the EMP to cost-effectively confirm the adequacy of mitigation measures implemented;
  - h. Preparation and submission of Contractor's Compliance Reports and inclusion of environmental mitigation measures into Contractor's progress reports;
  - i. Complaint investigation, evaluation and identification of corrective measures;
  - j. Additional monitoring works within the specified timeframe instructed by the Supervision Engineer and/or PMU; and
- Review the activities carried out by PMU3 and records and environmental documents submitted to PMU3 by the CSC and Contractor:
    - a. Allocation of staff responsible for environmental issues;
    - b. SEO, SES's recommendations, approval;
    - c. Records on complaints received and solutions;
    - d. Records of the mitigation measures implemented by PMU3 as specified in the EMP.

***Random site Inspection:***

As part of the monitoring process, the IEMC shall carry out a random check at the site. The IEMC shall visually look at the construction sites and make notes related to the following environmental issues, but not limited to:

- Compliance/violation to prohibitions to Contractor's workers as specified in the Environmental Specifications;
- Waste management practices at the construction sites,
- Disruption of exiting services during construction;
- General clean up after construction works;
- Impacts of construction works (level of noise, dust) on surrounding residential areas, and damage to roads due to earthworks and transportation of building materials;
- Status of implementation of safety measures (signboards, restricted zone, fences, the use of protective equipment, etc.), particularly at the intersections and other traffic hotspots;

The IEMC shall also conduct public consultation to:

- Assess the level of involvement by the local authorities in dealing with environmental

issues (dust, noise, and damage to roads due to the transport of construction materials and protected areas).

- Identify any other environmental issues and record environmental complaints from the affected people.
- Report on responses (if any) from appropriate local authorities on environmental complaints or in compliance

### ***Consultant Qualifications and staffing***

It is anticipated that the IEMC will be mobilized prior to the start of the construction activities. The one-month start up time will be utilized by the IEMC to review and familiarize itself with the project environmental monitoring program, and Environmental Management Plan, preparing the inception report and plan for their first field trip.

The Consultant shall submit the qualifications of the following key persons:

#### **1. Activity Leader/Senior Environmental Consultant**

The position will be a senior environmental specialist with at least a Master degree in environmental science or related discipline and have 10 year's experience working with the environmental aspects of construction. Priority is given to the person who has experience in assessing and monitoring environmental aspects related to roads and bridges. The Team leader should be familiar with the World Bank's environmental and social impact guidelines and have a proven record of managerial capabilities. The Team Leader will be responsible for directing the environmental monitoring for the project

He /she will lead the team during field visit on a three monthly basis to inspect the Contractor's compliance with the EMP, check the implementation of mitigation measures, assess the effectiveness and adequacy of the mitigation measures proposed/implemented, and give advices on additional mitigation measures or corrective actions, if necessary. At the end of each visit and before leaving the sites, he/she will lead discussion and brief to PMU, SES and SEOs about their main findings and advise them on what need to be improved, evaluate compliance to EMP. He will take lead in the preparation and quality control of the three monthly monitoring reports. Fluency in spoken and written English will be required.

#### **2. Field Environmental Inspection Officer(s)**

This position(s) will require at least 5 year's experience and a good understanding of the environmental issues related to roads and bridges, environmental impacts assessment and management processes. They will visit the project sites on a three monthly basis to inspect the Contractor's compliance with the EMP and check the implementation of mitigation measures. He/she will also check relevant environmental documents and records prepared during construction phase. At the end of each visit and before leaving the sites, they will participate in discussions with PMU, SES and SEOs about their main findings and advise them on what need to be improved. Knowledge of English language is required.

#### **3. Environmental Monitoring Specialist(s)**

This position(s) will require at least 5 years experience in environmental analysis and monitoring activities. They will be responsible for conducting environmental monitoring activities, including sampling, analyzing results and writing monitoring reports. Knowledge of the English language is required.

### ***Reporting Requirements and Time Schedule***

The report shall be submitted following the projects' requirement (including number of copies, hard copies and soft copies, etc.).

**Appendix 6: Training Demands and Proposals for a Training Program**

The table below presents an analysis of training demands

**Table 10. Analysis and Determination of Training Demands**

<b>No.</b>	<b>Subject</b>	<b>Preliminary assessment on capability/awareness</b>	<b>Capacity building/training on environmental management</b>
1	Environment Unit – PMU3	<ul style="list-style-type: none"> <li>- Have most staff with University/post university education, thus it is easy to them to comprehend new contents</li> <li>- Have working experiences in previous projects but have not gone into details of the environmental field.</li> <li>- Have basic knowledge in information technology, thus, it will be convenient for data management and information process as well as cooperation with other agencies.</li> </ul>	<ul style="list-style-type: none"> <li>- Should be further trained on environmental management process in project and implementation methods (from preparation stage of bidding documents, bid evaluation, contract signing, monitoring implementation and acceptance works, etc.).</li> <li>- Should increase awareness on critical roles of EMS</li> <li>- Should provide with more knowledge/legal regulations related to penalty for violations on the environment.</li> <li>- Should be provided with treatment solutions for arising problems on site.</li> </ul>
3	Local leaders	<ul style="list-style-type: none"> <li>- The communes have not been made sufficiently clear and understood about the project process.</li> <li>- Computer skills are still limited.</li> <li>- Awareness on community organization and monitoring is not clear.</li> <li>- Have no experiences in community monitoring on a large scale.</li> </ul>	<ul style="list-style-type: none"> <li>- Should be provided with preliminary knowledge on environmental laws and contents related to coordination in monitoring among ward/commune authorities in projects, which are executed in the areas.</li> <li>- Should be trained on community monitoring.</li> <li>- Should have updated information on project progress and monitoring and information exchange regime.</li> <li>- Especially, environmental management process should be made clear and comprehended before, during and after construction.</li> </ul>
4	Community representatives	<ul style="list-style-type: none"> <li>- Not been established in the local area, Thus participants have not been determined</li> <li>- Most project areas are rural</li> </ul>	<ul style="list-style-type: none"> <li>- Should be provided with rights and responsibilities in environmental management (as well as legal regulations.)</li> </ul>

No.	Subject	Preliminary assessment on capability/awareness	Capacity building/training on environmental management
		<p>ones with cultivation works. Education is limited and working style is primarily spontaneous.</p> <ul style="list-style-type: none"> <li>- Income of residents is not high; infrastructure system is not sufficient; awareness on rights and responsibilities of individuals and community on environmental issues are limited.</li> </ul>	<ul style="list-style-type: none"> <li>- Should be provided with clear simple methods, which will be applied during project implementation process.</li> <li>- Increase the awareness of community on environmental management generally and potential impact of the project in particular.</li> <li>- Continuously utilize project information and important points in EMS as well as operation regime.</li> </ul>
5	Contractor	<ul style="list-style-type: none"> <li>- Contractor's leaders are qualified and experienced staffs who are competent in legal regulations.</li> <li>- Periodically organize training courses on environmental sanitation and labor safety.</li> <li>- Most Contractors consider environmental issues as arising ones with a separate cost and do not want to implement them or rectify the issues.</li> <li>- Awareness of Contractors on environmental issues during construction is limited.</li> </ul>	<ul style="list-style-type: none"> <li>- Should learn about environmental law and focus on contents related to roles of local authority and community supervisors.</li> <li>- Should comprehend environmental management process following requirements of WB's safeguard policies.</li> <li>- However, for contractors these requirements will be followed through project documents and concrete criteria in bidding documents as well as construction contract.</li> </ul>

Based on an analysis of current capabilities, experiences and actual demands in project implementation, a capacity building and training program for relevant agencies is established as shown in the table below:

**Table 11. Proposed Capacity Building Programs on Environmental Management**

Training content	Subject to be trained	Number of trainees	Training time	Organization unit	Budget
Leaning on Labor safety and environmental sanitation	Contractor's workers and technical staff	All workers and staff on site	Prior to construction and following legal regulations	Contractor in coordination with Institute of Labor, War invalids and Social Affairs	Paid by Contractor

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Learning on general environmental management process	Staff of PMU3 and public utility companies	1 persons	Prior to construction	PMU3 in coordination with IEMC	Paid by PMU3 or to be included in a package on training
Learning on Process of CEMP	Environmental staff under ward PC in the project area	3 persons (1 district staff + 2 town/commune staff)	Prior to construction	Training consultant under Contract on capacity building and training for relevant agencies.	Included in Contract on training consulting
Learning on Process of SEMP	CSC's staff in charge of environmental	5 trainees	Prior to construction	PMU3 in coordination with CSC	In the Contract of CSC



## Appendix 7: Estimated Budget

### Cost of Environmental Supervision carried out by CSC

The CSC will be responsible for proposing organization and monitoring plans on the Contractor's compliance with mitigation measures. In addition, CSC will be required to assign staff and prepared detailed working plans to monitor environmental sanitation and labor safety management on and around the site. The cost for this assignment will be proposed in the contract with CSC.

### Monitoring Cost of Independent Environmental Monitoring Consultant (IEMC)

PMU3 shall sign a contract with IEMC. IEMC shall implement assignments of all project components according to the TOR.

The estimation costs for the IEMC (excluding monitoring and training costs) are following:

**Table 12. Cost Estimate for Environmental Management Work**

*Unit: VND*

No	Item	Unit	Quantity	Unit price	Amount
<b>I</b>	<b>Construction phase</b>				<b>66,150,000</b>
1	Environmental management staff (1 person)	month	3	21,000,000	63,000,000
2	Other costs	%	5	63,000,000	3,150,000
<b>II</b>	<b>Operation phase</b>				<b>88,200,000</b>
1	Environmental management staff (1 person)	month	4	21,000,000	84,000,000
2	Other costs	%	5	84,000,000	4,200,000
	<b>Total</b>				<b>154,350,000</b>

### Implementation Cost of the Monitoring Program

Based on the above-mentioned monitoring program the estimated costs for implementing this program are presented in the following table.

**Table 13. Costs estimation for the monitoring program**

*Unit: VND*

No	Item	Construction phase (within 9 months as expected)		Operation phase (2 years)		Total amount
		Location	Cost	Location	Cost	
1	Monitoring air quality	1	2,400,000	1	3,200,000	5,600,000
2	Monitoring noise	1	5,616,000	1	7,488,000	13,104,000
3	Monitoring vibration	1	5,616,000	1	7,488,000	13,104,000
4	Monitoring water quality	1	2,160,000	-	-	2,160,000

No	Item	Construction phase (within 9 months as expected)		Operation phase ( 2 years)		Total amount
		Location	Cost	Location	Cost	
5	Other costs		26,967,036		35,630,608	62,597,644
	<b>Total</b>		<b>42,759,036</b>		<b>53,806,608</b>	<b>96,565,644</b>

Notes: The above cost estimate excludes VAT tax. Other costs include costs for manpower, traveling, preparation of survey reports, etc.

Total estimated cost for implementation of a monitoring program is 96,565,644 VND. For the purpose of effective implementation, the monitoring program implementation can be combined with the contract established with IEMC.

### Cost for implementation of capacity building and training

The cost estimation for implementation of capacity building and training is presented in the following table:

**Table 14. Cost estimation for implementation of capacity building and training**

Training contents	Subject to be trained	Number of trainees	Cost rate (VND)	Source of cost
Learning on labor safety and environment sanitation	Workers and technicians of Contractors	All workers and construction staff on site (100) turns of	100 x 200,000 = 20,000,000	Paid by contractor, this cost is included in the contract of construction
Learning of general environmental	PMU3's staff in charge of construction	01 person	01 x 3,000,000 = 3,000,000	This cost should be included in the contract signed with
Learning on CEMP	Environmental staff under ward/commune PC in the project area	03 persons (01 district officers + 02 commune officers)	3 persons x 1,000,000/person = 3,000,000	Included in the Contract signed with training consultant or IEMC
Learning on SEMP	Staff in charge of labor safety and environmental sanitation under CSC	5 trainees	5 per, x 1000,000/per, = 5,000,000	In the Contract of CSC
<b>Total cost</b>			<b>31,000,000</b>	