

# **Bhutan for Life**

## **Environmental and Social Management Plan for**

### **RMNP (2022)**

#### **1. INTRODUCTION**

##### **(A) Project Background**

Bhutan for Life (BFL) project aims to ensure a robust network of protected areas and biological corridors that secures human well-being, biodiversity conservation and increase climate resilience in Bhutan. The project provides a 14-year financial bridge that allows for immediate improvement in the management of Bhutan's protected areas for climate resilience, and the prompt delivery of mitigation, adaptation and biodiversity gains, while the country gradually ratchets up its own financing resources.

BFL seeks to achieve the following objectives:

- Help Bhutan remain carbon neutral by increasing forest and vegetative cover within the Protected Area System;
- Enhance the socio-economic wellbeing of communities in and in the vicinity of the PAS through climate-informed natural resources management;
- Maintain stable, thriving and diverse populations of key species contributing toward national and global biodiversity goals;
- Strengthen organizational, institutional, and financial capacity for effective management of PAS.

BFL includes five components that reflect these goals, divided into 16 milestones (or outputs) and over 80 detailed activities.

##### **(B) Scope of ESMP**

The preparation of this Environmental and Social Management Plan (ESMP) was required in order to manage the environmental and social impacts through and specific mitigation actions required to implement the project in accordance with the requirements of WWF's SIPP, the project's Environmental and Social Management Framework (ESMF), and applicable national legislation and regulations.

The ESMP provides an overview of the environmental and social baseline conditions on the routes of the proposed second segment of the project, summarizes the potential impacts associated with the proposed activities and sets out the management measures required to mitigate any potential negative impacts.

This ESMP will be implemented by BFL focal person in each park authority (PA) and biological

corridor (BC), and by the contractor to be commissioned by each PA\BC for the project.

### **(C) Purpose of ESMP**

This Site-Specific ESMP is a project-specific source document detailing the environmental and social protection requirements to mitigate and minimize the adverse impacts. The ESMP's primary purpose is to ensure that the environmental requirements and social commitments associated with the project are carried forward into implementation and operational phases of the project and are effectively managed. The specific objectives of this ESMP are as hereunder:

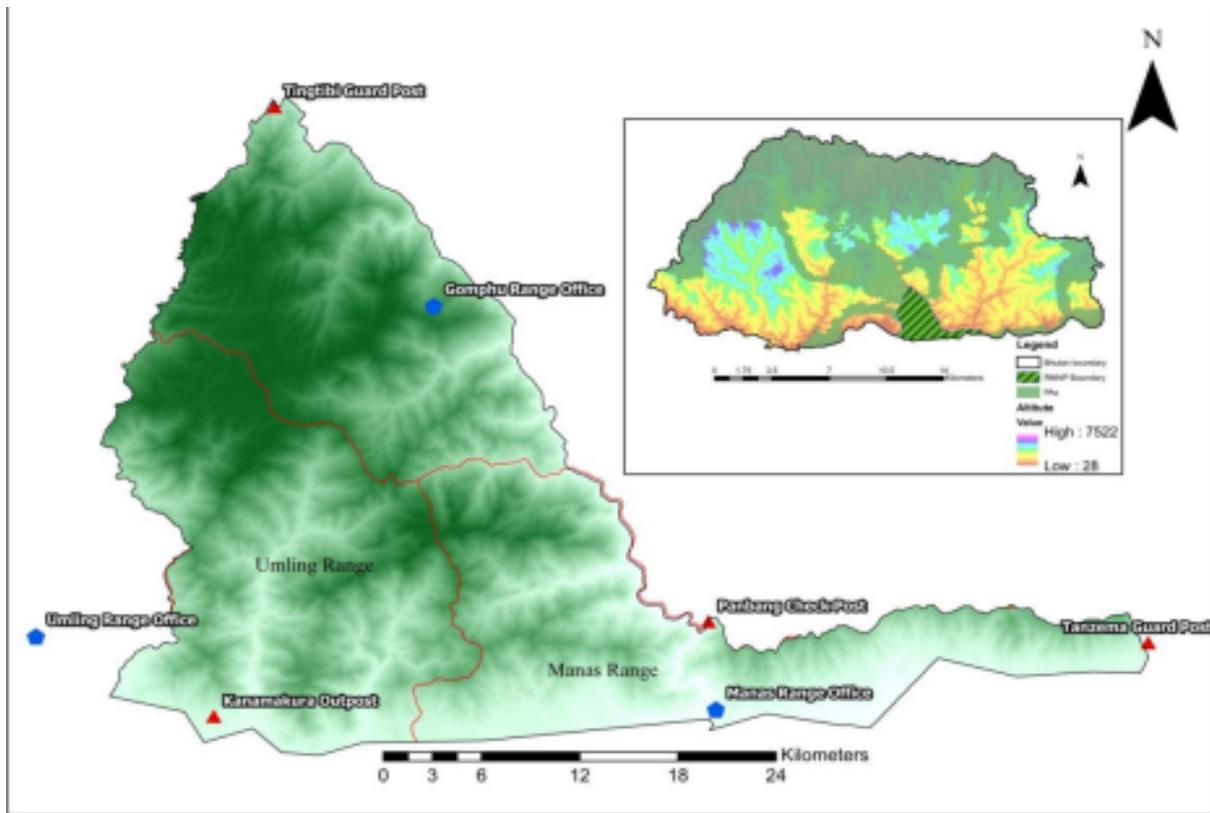
- Minimizing any adverse environmental, social and health impacts resulting from the project activities;
- Conducting all project activities in accordance with the relevant RGoB Laws and WWF's safeguard operational policies and guidelines;
- Preventing environmental degradation as a result of either individual subprojects or their cumulative effects;
- Enhancing the positive environmental and social outcomes of project activities;
- Ensuring that the proposed mitigation measures are feasible and cost-efficient;
- Providing an Action Plan to ensure that the project impact mitigation measures are properly implemented and monitored;
- Ensuring that all stakeholders are engaged in the project activities' preparation and implementation, and their concerns are fully addressed.

## **2. ENVIRONMENTAL AND SOCIO-ECONOMIC CONDITIONS**

### **(A) Geological and topographical conditions**

Royal Manas National Park (RMNP) established as game sanctuary and later notified as Manas Wildlife Sanctuary in 1964 is the oldest park in Bhutan. It was gazetted as National Park in 1993. Spanning an area of 1057.28 sq. km, the park is located at the convergence of the Indo-Gangetic and Indo-Malayan bio-geographical realm. The park forms cornerstone of PA network as it shares corridors with Jigme Singye Wangchuck National Park (JSWNP) in northwest, Jomotshangkha Wildlife Sanctuary (JWS) in southeast, Phibsoo Wildlife Sanctuary (PWS) in the southwest and Phrumsengla National Park (PNP) in central north. Further the park abuts with Indian Manas National Park in the south and forms significant part of Transboundary Manas Conservation Area (TraMCA) thereby promoting ecosystem management at landscape level.

The forest type of the park is generally sub-tropical forest. It is further classified into four eco floristic zones; Tropical monsoon forests (< 500 m), Sub-tropical forests (500 -1000 m), Warm broadleaved forests (1000 – 2000 m) and Cool broadleaved forests (2000-2714 m). The southern belt of the park has an interspersed of irregular swathes of grasslands.



**Figure 1:** Location map of RMNP along with jurisdiction of rang offices.

The geology of RMNP consists mostly of Buxa formation characterized of dolomites, quartzite, variegated phyllite, metasedimentary phyllite and limestone bed rocks. The southern part of the park consists of bhabar tract containing sandstone, limestone and shale. Alluvial and colluvial formation result from slow erosion of rock from the northern area of the park stemming as a result of heavy rainfall during monsoon. Boulders are of granite, gneiss and quartzite and the gravel deposits contain granite, gneiss, phyllite, and slate schist.

### **(B) Climatic conditions**

Royal Manas National Park has a moist subtropical to cool temperate climate with four distinct seasons. Summer lasts from May to August with annual maximum temperature ranging from 20°C to 40°C. The rainfall ranges from 200 mm to 4400 mm annually. Autumn lasts between September and November experiencing changeable weather, which gradually takes on the shape of winter pattern. Characterized by cool weather and fog, winter is relatively drier with rare shower and average temperature ranges from 5°C to 20°C. The park experiences strong to moderately strong wind in the months of February- April.

### **(C) Hydrological conditions**

Royal Manas National Park abounds with towering mountains punctuated with perennial rivers and transitory rivers and streams. The largest river of the country, Manas drains about two third

volume of the water of the country. It springs from four major tributaries viz. Mangde Chhu, Chamkar Chhu, Kuri Chhu and Drangme Chhu in eastern and central Bhutan. The other perennial rivers such as Udigang, Kukulung, Kanamakura and Sukuntaklai rivers forms some of the important watersheds of RMNP. Many other transitory and seasonal streams are evident along the southern foothill landscapes during monsoon season. Waterholes forms an integral part of functioning ecosystem and are erratically distributed with higher density along the foothill belt of the park.

#### **(D) Flora and fauna**

RMNP is famed for harboring great populace of wildlife diversity. The park is home to 65 species of mammals, 497 birds, 69 fishes, 181 butterflies, 69 herpetofauna and more than 900 vascular plant species. It provides safe refuge for many charismatic and threatened species such as Royal Bengal tiger, Golden Langur, Clouded leopard, Asian elephant, Asiatic water buffalo, Asiatic wild dog and Asiatic gaur. About 48% of mammal species recorded in the park are threatened species red listed by IUCN. The park is unarguably one of the strongholds of tigers in Bhutan. Since 2011, the Park management had been conducting annual monitoring of tiger population initiated under the aegis of TraMCA. The park is one among two national parks from Bhutan which is approved site for Tiger conservation under Conservation Assured Tiger Standard (CATS) in 2019. In the subsequent year, the park is the joint winner of the Conservation Excellence Award TX2 along with Manas Tiger Reserve, India.

The national park is also home to globally rare and endangered floral species such as *Dalbergia oleyeri* (IUCN endangered species), *Aquilaria malaccensis* (IUCN vulnerable), *Taxus baccata* (Scheduled 1 species in FNCA 1995) and *Podocarpus neriifolia* the only conifer broadleaved tree found rarely distributed in the park area.

#### **(E) Socio-economic conditions**

RMNP falls within the political jurisdiction of three Dzongkhags (Zhemgang, Sarpang and Pemagatshel). Like many other parks in the country, there are community settlements living within and in the vicinity of RMNP. There are about 1400 households with 5331 people living in the park. Majority of the people depend their livelihood on agro-farming system. They cultivate primarily paddy as food crop and grows areca nut, oranges, cardamom and ginger as cash crops. Living in the forest fringe areas, their life style is dependent on forest-based resources such as NWFPs and other forest produces. They also earn living by rearing livestock and poultry farms. Rearing improved cattle breed particularly *Jersey* cow has become common practices due to earning of high income from dairy products.

Although the communities are politically into different jurisdiction, their customs and tradition doesn't differ much. However, in terms of their language, there is a slight difference in their native dialect. People in Pema Gatshel commonly speak *Sharchopkha*, Zhemgang people speak Khengkha and people in Sarpang speaks commonly *Nepali* and *Sharchopkha*.

### **3. PLANNED ACTIVITIES IN YEAR 4 (2022)**

### Activity 3: Maintenance of a guest house at Manas

- Budget: Nu. 0.300 M
- Timeline: Oct – Dec (2022)
- Location: Manas

#### Description:

Manas Range office is located at Manas under Ngangla Gewog, Zhemgang. Manas Range office compound is consisting of several structures including a guest house, staff quarters, Basic Health Units and military outpost. The guest house is one of the oldest and important structures within the compound and with the recent incessant rainfall, the roofing, ceilings and wall were damaged. Now, it is in dire need of maintenance and the budget required is Nu. 0.3 M. Based on the urgent need at the field, it has been planned to be met from Umling staff quarter maintenance with a total allocation of Nu. 1.2 M under BFL funding. The balance of Nu. 0.9 M will be used for the Umling staff quarter maintenance.

As a part of maintenance work, activities such as repairing of roof, ceiling, window frames and doors will be carried out. The maintenance work will be done by deploying around 8 to 10 skilled local labourers. Materials such as cement, bitumen sheets, paints, planks, sands and aggregates will be used for the maintenance work. The labourers will be temporarily sheltered at the site within the Manas range compound. The proposed site compound measuring about 12.14 Ha is surrounded by thick sub-tropical forest and except for few forestry staffs, army personnel, health staff and their families, there is no other private settlement in the area. Nearest settlement is Panbang which is around 10 km away from the Manas which is on the other side of Manas River. The staffs and families residing at the Manas Range office compound commute across Manas River using wooden boats.

3.3.1 Potential social and environmental impacts of the activity are;

- Waste management during maintenance work
- Workers' health and safety

## 4. MITIGATION MEASURES FOR ENVIRONMENTAL AND SOCIAL IMPACTS

Potential impact	Impact scale	Proposed mitigation measures	Responsible party	Costs
Activity 2: Maintenance of a Guest house at Manas				
Waste management during maintenance work	Short time Minor	• Proper containers/waste bins should be provided at the activity site	RMNP management	

		<ul style="list-style-type: none"> <li>• Dumping of waste in the river, in its vicinity, or in other non-designated places should be strictly prohibited</li> <li>• Collection, transportation and final disposal of all waste should be carried out on a daily basis and not left in the river areas</li> <li>• Burning of waste should be prohibited</li> </ul>		
Workers' health and safety	Short time Minor	<ul style="list-style-type: none"> <li>• Comply with the workers' health and safety guidelines</li> <li>• Access to health facilities for the workers pre and during construction activities need to be available and ensure first aid kit is available at construction site &amp; Basic health unit (BHU) needs to be available in walkable distance.</li> <li>• Ensure that no underage workers, or children are engaged</li> <li>• Ensure conducive working environment, including an appropriate salary, working hours and accommodation shall be provided to all workers.</li> <li>• Ensure workers are employed on the principle of equal opportunity &amp; fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, and disciplinary practices</li> <li>• Implement a grievance mechanism for workers to raise workplace concerns - the worker with grievance shall report in their grievance to Range/beat/ HQ or gewog office. All workers shall be briefed about the GRM before starting the work.</li> </ul>	RMNP management	

## 5. ESMP IMPLEMENTATION ARRANGEMENTS

The implementation of project activities will be carried out by the RMNP management. The BFL focal person in RMNP shall work under the supervision of management to implement the BFL project activities in RMNP. The management and focal person are responsible for compliance with all procedures outlined in this ESMP and compliance with any requirements to obtain clearances, permits, approvals, or consent documents from relevant authorities and stakeholders.

This ESMP should be part of the contract that the RMNP management will sign with the Contractor(s) and other relevant stakeholders for implementation of the planned activities in RMNP in 2022. The Contractor or implementers are obligated to perform all proposed preventive or mitigation environmental and social measures in this plan and to keep the evidence of any documents related to applying these measures (e.g., letter asking the municipality for disposal of inert waste, records on OHS information session performed for all workers before start of activities, all developed EHS plans, etc.). An OHS information session should be organized by the Contractor or implementers for all workers prior to start of the project activities and prior to any specific tasks associated with high health risks.

## 6. ESMP MONITORING ARRANGEMENTS

Sl. No	Activities	Monitoring team	Timeline		Location	Means of Verification
			Start	Complete		
3	Maintenance of a guest house at Manas	Field focal	Oct 2022	Nov 2022	Manas, Ngangla Gewog, Zhemgang	Physical verification of site. Submit monitoring report to ESS focal, PCU
		ESS focal	Nov 2022	Nov 2022		
		Quarterly reports by PCU (ESS officer) to M&E Officer and then to Fund Secretariat	Dec 2022	Dec 2022		
		Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)	Dec 2022	Dec 2022		

## 7. CAPACITY NEEDS AND BUDGET

Sl. No.	Activities	Budget (Million) Nu.	Budget for ESS mitigation (Nu) Million
1	Maintenance of a guest house at Manas	0.300	No separate budget for ESS mitigation is required. ESS mitigation measures will be met from total budget for the respective activities

## 8. CONSULTATION AND DISCLOSURE MECHANISMS

This ESMP has been prepared in a participatory manner and the officials residing in the vicinity has been informed of the maintenance works. The maintenance site and staff quarters are at a distance of 250-300 meters. It was also consulted verbally with the park management and local leaders, the *Gups* (head of *Gewogs*) who represents the whole communities. The management informed the local leader regarding the planned project activities, solicit their opinions and enable them to question proposed mitigation measures.

The full English version of this ESMP, as well as an executive summary in Bhutanese, shall be disclosed on the website of MoAF and WWF, Bhutan Program. Hard copies of the ESMP should also be available at the RMNP Management Office and at the PCU Office.

## **9. STAKEHOLDER ENGAGEMENT PLAN**

The proposed activities for RMNP under the BFL funded project for year 4 (2022) are all inside the park area and there are no settlements in the activity sites or in the vicinity, therefore it is unlikely that the activity will create any adverse environment and social impacts. However, in the lieu of unseen impacts in the future, the RMNP management has consulted with local leaders verbally to solicit their opinions and to enable them to question proposed mitigation measures. And the *Gups* informed there is no objection as there are no settlements.

In case there are any consultations carried out during implementation due to any unforeseen consequences, the BFL focal person under the supervision of RMNP management shall submit the official minutes of the consultation meetings (along with a list of participants, disaggregated by gender and age) to the ESS officer within one week after the completion of the consultation. The ESS officer will submit the consultation reports to the PCU (M&E officer) one week after their receipt. The PCU (M&E officer) will report to the Secretariat on a semi-annual basis.

## *Annexure I: BFL: OCCUPATIONAL HEALTH AND SAFETY STANDARDS*

Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. Implementing entities should hire contractors that have the technical capability to manage the occupational health and safety issues of their workers, extending the application of the hazard management activities through formal procurement agreements.

This section provides guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. It is based on the IFC's Environmental, Health, and Safety Guidelines (April 30, 2007)<sup>1</sup> and the Occupational Health and Safety Guidelines of Bhutan's Construction Development Corporation Ltd., which relies on the national Regulation on Occupational Health, Safety and Welfare 2012, Regulation on Working Conditions 2012 and Labour Act 2007, and in compliance to Sl. No. 21 of Regulation on Occupational Health, Safety and Welfare 2012.

### **1. General Facility Design and Operation**

#### *Integrity of Workplace Structures*

Permanent and recurrent places of work should be designed and equipped to protect occupational health and safety:

- Surfaces, structures and installations should be easy to clean and maintain, and not allow for accumulation of hazardous compounds.
- Buildings should be structurally safe, provide appropriate protection against the climate, and have acceptable light and noise conditions.
- Fire resistant, noise-absorbing materials should, to the extent feasible, be used for cladding on ceilings and walls.
- Floors should be level, even, and non-skid.
- Heavy oscillating, rotating or alternating equipment should be located in dedicated buildings or structurally isolated sections.

#### *Severe Weather and Facility Shutdown*

- Workplace structures should be designed and constructed to withstand the expected elements for the region and have an area designated for safe refuge (e.g., in case of earthquake).

#### *Workspace and Exit*

- The space provided for each worker, and in total, should be adequate for safe execution of all activities, including transport and interim storage of materials and products.

#### *Fire Precautions*

The workplace should be designed to prevent the start of fires through the implementation of fire codes applicable to industrial settings. Other essential measures include:

- The workplace shall be provided with adequate means of protection and escape in case of fire.
- The workplace shall be provided with adequate number of relevant fire extinguishers.

---

1

<https://www.ifc.org/wps/wcm/connect/1d19c1ab-3ef8-42d4-bd6b-cb79648af3fe/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES&CVID=ls62x8l>

- Workers shall wear shoes without iron or steel nails or any other exposed ferrous materials which is likely to cause sparks by friction.
- Smoking, lightening, or carrying of matches, lighters or smoking materials shall be prohibited.
- All other precautions, as are reasonably practicable, shall be taken to prevent initiation of ignition from all other possible sources such as open flames, frictional sparks, overheated surfaces of machinery or plant, chemical or physical, chemical reaction and radiant heat.
- At every workplace adequate provision of water supply for firefighting shall be provided and maintained.
- Equipping facilities with firefighting equipment (e.g., fire extinguishing bottle). The equipment should be maintained in good working order and be readily accessible. It should be adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present.
- Manual firefighting equipment shall be easily accessible and simple to use.
- Fire extinguishers and emergency alarm systems that are both audible and visible should be in place.

#### ***Lavatories and Showers***

- Adequate lavatory facilities (toilets and washing areas) should be provided for the number of people expected to work in the facility (at least one for every 20 workers). Toilet facilities should also be provided with adequate supplies of hot and cold running water and soap.

#### ***Potable Water Supply***

- Adequate supplies of potable drinking water should be provided to workers at the work site.

#### ***Clean Eating Area***

- Where there is potential for exposure to substances poisonous by ingestion, suitable arrangements are to be made for provision of clean eating areas where workers are not exposed to the hazardous or noxious substances.

#### ***Lighting***

- Workplaces should, to the degree feasible, receive natural light and be supplemented with sufficient artificial illumination to promote workers' safety and health, and enable safe equipment operation. Supplemental 'task lighting' may be required where specific visual acuity requirements should be met.
- Emergency lighting of adequate intensity should be installed upon failure of the principal artificial light source to ensure safe shut-down, evacuation, etc.

#### ***Safe Access***

- Passageways for pedestrians and vehicles within and outside buildings should be segregated and provide for easy, safe, and appropriate access.
- Equipment and installations requiring servicing, inspection, and/or cleaning should have unobstructed, unrestricted, and ready access.
- Covers should, if feasible, be installed to protect against falling items.
- Measures to prevent unauthorized access to dangerous areas should be in place.

### *First Aid*

- The employer should ensure that qualified first-aid can be provided at all times. A sufficient number of first aid boxes or cupboards shall be provided and maintained so as to be readily available during all working hours, provided that the distance of the nearest first aid box or a cupboard shall be not more than 200m from any working place.
- First aid kits include all equipment outlined in Annex 1 to these Guidelines.
- Remote sites should have written emergency procedures in place for dealing with cases of trauma or serious illness up to the point at which patient care can be transferred to an appropriate medical facility.

### *Work Uniform*

- The contractor shall provide a working uniform to each worker.
- All workers shall be required to attend the duty in proper uniform unless otherwise instructed by the Contractor.

### *Air Supply*

- Sufficient fresh air should be supplied for indoor and confined workspaces. Factors to be considered in ventilation design include physical activity, substances in use, and process related emissions. Air distribution systems should be designed so as not to expose workers to draughts.
- Re-circulation of contaminated air is not acceptable. Heating, ventilation and air conditioning (HVAC) systems should be equipped, maintained and operated so as to prevent growth and spreading of disease agents (e.g. Legionella pneumophila) or breeding of vectors (e.g. mosquitoes and flies) of public health concern.

## **2. Information Provision on Occupational Health and Safety (OHS)**

The Contractor is responsible to hold an information session to familiarize all workers with the OHS procedures specified in these guidelines, in order to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow workers.

The information session should consist of basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Any site-specific hazard or color coding in use should be thoroughly reviewed as part of orientation training.

## **3. Physical Hazards**

Physical hazards represent potential for accident or injury or illness due to repetitive exposure to mechanical action or work activity.

### *Rotating and Moving Equipment*

Injury or death can occur from being trapped, entangled, or struck by machinery parts due to unexpected starting of equipment or unobvious movement during operations. Recommended protective measures include:

- Designing machines to eliminate trap hazards and ensuring that extremities are kept out of harm's way under normal operating conditions. Examples of proper design considerations

include two-hand operated machines to prevent amputations or the availability of emergency stops dedicated to the machine and placed in strategic locations.

- Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment should be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Guards should be designed and installed in conformance with appropriate machine safety standards.

### *Noise*

- No worker should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).
- The use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A). Hearing protective devices provided should be capable of reducing sound levels at the ear to at least 85 dB(A).
- Although hearing protection is preferred for any period of noise exposure in excess of 85 dB(A), an equivalent level of protection can be obtained, but less easily managed, by limiting the duration of noise exposure. For every 3 dB(A) increase in sound levels, the 'allowed' exposure period or duration should be reduced by 50 percent.
- Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented, where feasible.
- Periodic medical hearing checks should be performed on workers exposed to high noise levels.

### *Vibration*

Exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, should be controlled through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure.

### *Electrical*

Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords and hand tools, can pose a serious risk to workers. Overhead wires can be struck by metal devices, such as poles or ladders, and by vehicles with metal booms. Vehicles or grounded metal objects brought into close proximity with overhead wires can result in arcing between the wires and the object, without actual contact. Recommended actions include:

- Marking all energized electrical devices and lines with warning signs
- Locking out (de-charging and leaving open with a controlled locking device) and tagging-out (warning sign placed on the lock) devices during service or maintenance
- Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools
- Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter (GFI) protected circuits
- Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas
- Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited

- Establishing “No Approach” zones around or under high voltage power lines
- Rubber tired construction or other vehicles that come into direct contact with, or arcing between, high voltage wires may need to be taken out of service for periods of 48 hours and have the tires replaced to prevent catastrophic tire and wheel assembly failure, potentially causing serious injury or death
- Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work

### ***Eye Hazards***

Solid particles from a wide variety of industrial operations, and/or a liquid chemical spray may strike a worker in the eye causing an eye injury or permanent blindness. Recommended measures include:

- Use of machine guards or splash shields and/or face and eye protection devices, such as safety glasses with side shields, goggles, and/or a full-face shield. Frequent checks of these types of equipment prior to use to ensure mechanical integrity is also good practice.
- Where machine or work fragments could present a hazard to transient workers or passers-by, extra area guarding or proximity restricting systems should be implemented, or PPE required for transients and visitors.
- Provisions should be made for persons who have to wear prescription glasses either through the use of overglasses or prescription hardened glasses.

### ***Welding / Hot Work***

Welding creates an extremely bright and intense light that may seriously injure a worker’s eyesight. In extreme cases, blindness may result. Additionally, welding may produce noxious fumes to which prolonged exposure can cause serious chronic diseases. Recommended measures include:

- Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific work station (a solid piece of light metal, canvas, or plywood designed to block welding light from others). Devices to extract and remove noxious fumes at the source may also be required.

### ***Working Environment Temperature***

Exposure to hot or cold working conditions in indoor or outdoor environments can result temperature stress-related injury or death. Use of personal protective equipment (PPE) to protect against other occupational hazards can accentuate and aggravate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided through implementation of engineering controls and ventilation. Where this is not possible, such as during short-term outdoor work, temperature-related stress management procedures should be implemented which include:

- Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly
- Providing temporary shelters to protect against the elements during working activities or for use as rest areas
- Use of protective clothing
- Providing easy access to adequate hydration such as drinking water or electrolyte drinks, and avoiding consumption of alcoholic beverages

### ***Ergonomics, Repetitive Motion, Manual Handling***

Injuries due to ergonomic factors, such as repetitive motion, overexertion, and manual handling, take prolonged and repeated exposures to develop, and typically require periods of weeks to months for recovery. These OHS problems should be minimized or eliminated to maintain a productive workplace. Controls may include:

- Facility and workstation design with 5th to 95th percentile operational and maintenance workers in mind
- Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds
- Selecting and designing tools that reduce force requirements and holding times, and improve postures
- Incorporating rest and stretch breaks into work processes, and conducting job rotation
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions

### ***Working at Heights***

Fall prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling more than two meters; into operating machinery; into water or other liquid; into hazardous substances; or through an opening in a work surface. Fall prevention / protection measures may also be warranted on a case-specific basis when there are risks of falling from lesser heights. Fall prevention may include:

- Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area
- Proper use of ladders and scaffolds by trained workers
- Use of fall prevention devices, including safety belt and lanyard travel limiting devices to prevent access to fall hazard area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards or self-retracting inertial fall arrest devices attached to fixed anchor point or horizontal life-lines
- Appropriate training in use, serviceability, and integrity of the necessary PPE
- Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall

### ***Illumination***

Work area light intensity should be adequate for the general purpose of the location and type of activity, and should be supplemented with dedicated work station illumination, as needed. Controls should include:

- Use of energy efficient light sources with minimum heat emission
- Undertaking measures to eliminate glare / reflections and flickering of lights
- Taking precautions to minimize and control optical radiation including direct sunlight.
- Exposure to high intensity UV and IR radiation and high intensity visible light should also be controlled
- Controlling laser hazards in accordance with equipment specifications, certifications, and recognized safety standards. The lowest feasible class Laser should be applied to minimize risks.

## **4. Personal safety equipment for workers**

All workers are equipped with the following personal safety equipment: helmet, gloves, ordinary boots and reflective vest. Workers that are exposed to dust should also be provided with eye protection

glasses and face mask. Workers that are exposed to noise should be provided with ear plugs. Workers that need to work in the dark should be provided with hand and cap lamps.

Workers are instructed regarding safety equipment as follows:

- Always wear complete set of protective wear.
- Do not wear loose clothing, such as overhang shirt, jackets, mufflers etc.
- Tuck shirt and jacket well.
- Secure helmet with belt under the chin.
- Tuck the bottom sleeves of trouser inside safety boot.
- Dress with reflector

## **5. Standards for workers' accommodation<sup>2</sup>**

### 1. General living facilities

- The location of the facilities is designed to avoid flooding or other natural hazards
- The living facilities are located within a reasonable distance from the worksite.
- Transport is provided to worksite safe and free.
- The living facilities are built using adequate materials, kept in good repair and kept clean and free from rubbish and other refuse.

### 2. Drainage

- The site is adequately drained.

### 3. Heating, air conditioning, ventilation and light

- Living facilities are provided with adequate heating, ventilation, and light systems including emergency lighting.

### 4. Water

- Workers have easy access to a supply of clean/ potable water in adequate quantities.
- The quality of the water complies with national/local requirements or WHO standards.
- Tanks used for the storage of drinking water are constructed and covered to prevent water stored therein from becoming polluted or contaminated.
- The quality of the drinking water is regularly monitored.

### 5. Wastewater and solid waste

- Wastewater, sewage, food and any other waste materials are adequately discharged in compliance with national and/or international standards and without causing any significant impacts on camp residents, the environment or surrounding communities.
- Specific containers for rubbish collection are provided and emptied on a regular basis.
- Pest extermination, vector control and disinfection are undertaken throughout the living facilities at least once.

### 6. Rooms/dormitories facilities

---

<sup>2</sup> Based on Workers' accommodation: processes and standards—A guidance note by IFC and the EBRD (August 2009): [https://www.ifc.org/wps/wcm/connect/60593977-91c6-4140-84d3-737d0e203475/workers\\_accommodation.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-60593977-91c6-4140-84d3-737d0e203475-jqetNlh](https://www.ifc.org/wps/wcm/connect/60593977-91c6-4140-84d3-737d0e203475/workers_accommodation.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-60593977-91c6-4140-84d3-737d0e203475-jqetNlh)

- Rooms/dormitories are kept in good condition.
- Rooms/dormitories are aired and cleaned at regular intervals.
- Rooms/dormitories are built with easily cleanable flooring material.
- Rooms/dormitories and sanitary facilities are located in the same buildings.
- Residents are provided with enough space.
- The number of workers sharing the same room/dormitory is minimized.
- Doors and windows are lockable and provided with mosquito screens when necessary.
- Mobile partitions or curtains are provided.
- Adequate number of furniture such as table, chair, mirror, and lamps are provided for all workers.
- Separate sleeping areas are provided for men and women.

#### 7. Bed arrangements and storage facilities

- A separate bed is provided for every worker.
- The practice of “hot-bedding” is prohibited.
- There is a minimum space of 1 meter between beds.
- The use of double deck bunks is minimized.
- If double deck bunks are in use, there is enough clear space between the lower and upper bunk of the bed.
- Workers are provided with comfortable mattresses. Workers may be expected to use their own pillows and bed linens.
- Workers wash bed linen frequently and applied with adequate repellents and disinfectants (where conditions warrant).
- Adequate facilities for the storage of personal belongings are provided.
- Separate storages for work clothes and PPE and depending on condition, drying/airing areas are provided.

#### 8. Sanitary and toilet facilities

- Sanitary and toilet facilities are constructed from materials that are easily cleanable.
- Sanitary and toilet facilities are cleaned frequently and kept in working condition.
- Toilets, showers/bathrooms and other sanitary facilities are designed to provide workers with adequate privacy including ceiling to floor partitions and lockable doors.
- Separate sanitary and toilet facilities are provided for men and women.
- Toilet facilities are conveniently located and easily accessible.
- Toilet facilities are environmentally friendly (e.g., pit toilet) and sewage is not disposed into the worksite.
- Open defecation in the vicinity of project sites should be prohibited.
- An adequate number of hand wash basins and showers/bathrooms facilities are provided.
- Shower facilities are provided with water heating facilities.

#### 9. Cooking and laundry facilities

Cooking and laundry facilities should be available for workers at the worksite or in close vicinity to it. These facilities should be kept in clean and sanitary conditions.

#### 10. Leisure, social and telecommunications facilities

- Basic social collective spaces should be available to workers.
- Workers are provided with dedicated places for religious observance, as appropriate.

- The employer provides workers with local sim cards that can be used for communication on their personal cell phones.

### **Annex 1. Contents of first aid box or cup-boards**

The first aid boxes or cup-boards shall be distinctively marked with white cross on a green background and shall contain the following equipment:

1. Small sterilized dressings (12)
2. Medium size sterilized dressings (6)
3. Large size sterilized dressings (6)
4. Large size sterilized burn dressings (6)
5. (1/2 oz.) Sterilized cotton wool (6 packets)
6. (2oz.) Bottle containing a two per cent alcoholic solution of iodine (1)
7. (2oz.) Bottle containing Betadine (antiseptic solution) having the dose and mode of administration indicated on the label (1)
8. Roll of adhesive plaster (1)
9. A snake bite lancet (1)
10. Torch light (1)
11. Pair of scissors (1)
12. Tablets Aspirin (5gms) 2 dozen
13. Burn Ointment (2 tubes)
14. Dettol (2 phial, about 2 ozs)
15. Bandages 4 inches wide
16. Bandages 2 inches wide
17. Triangular bandages (2)
18. Packets of safety pins (1)
19. A supply of suitable splint