Bhutan for Life

Environmental and Social Management Plan for

<u>BC-02 (2021)</u>

1. Introduction

(A) Project Background

The 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 (PAS);

• 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 Social Safeguards Integrated Policies and Procedures (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;

2 • 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.

(D) Applicable law, policies, and regulation

This ESMP is developed by following the guidelines as set forth in the BFL's ESMF. Applicable RGoB laws and policies include the Constitution of the Kingdom of Bhutan, 2008; legislation on land and moveable property (Land Act of Bhutan 2007; Land Rules, 2007; The Moveable Cultural Property act of Bhutan, 2005); legislation and regulations on forests and protected areas (National Environment Protection Act, 2007; Forest and Nature Conservation Act of Bhutan, 1995; Forest and Nature Conservation Rules and Regulations of Bhutan, 2017; National Forest Policy, 2011); legislation on water and waste prevention (Water Act of Bhutan, 2011; Waste Prevention and Management Act, 2009); legislative requirements on environmental assessment (Environmental Assessment Act, 2000 and Regulations on the Environmental Clearance of Projects, 2001); and other relevant laws (The Local Government Act of Bhutan, 2009; Livestock Act of Bhutan, 2001; The Biodiversity Act of Bhutan, 2003; The Pesticides Act of Bhutan, 2000; The Penal Code of Bhutan, 2004; National Access and Benefit Sharing (ABS) Policy (Draft), 2014). WWF's safeguards policies that are relevant to this project are as follows: Policy on Environment and Social Risk Management; Policy on Protection of Natural Habitats; Policy on Involuntary Resettlement; Policy on Indigenous Peoples; Standard on Pest Management; Policy on Accountability and Grievance System; Standard on Physical Cultural Resources; as well as general standards on occupational and community health and safety and on energy efficiency.

In general, RGoB's laws, policies, and guidelines are in line with the WWF's environmental and social safeguards requirements. However, there are a few differences between the two systems. With regard to environmental impacts, there are no direct contradictions between the RGoB laws and regulations and the WWF's SIPP, but the requirements of the latter are more extensive. All project activities should fully comply both with the RGoB's Regulations on the Environmental Clearance of Projects, and with the procedures and mitigation measures prescribed in this ESMF. In case that the WWF's SIPP requirements are more extensive, strict, or detailed than the RGoB legislation and policies, the former will apply to all project activities. With regard to social impacts, the primary discrepancies between the RGoB laws and regulations and the WWF's SIPP refer to the status of non-title holders and informal land use, and the commitment to participatory decision-making processes. First, according to the WWF's SIPP, all users of land and natural resources (including people that lack any formal legal ownership title or usage rights) are eligible to some form of assistance or compensation if the project adversely affects their livelihoods. The RGoB laws only recognize the eligibility of land owners or formal users to receive compensation in such cases. Second, the WWF's SIPP require extensive community consultations as part of the development of various safeguards documents and during project activities. RGoB legislation does not include similar requirements. For the purposes of the BFL project, the provisions of the WWF's SIPP shall prevail over the RGoB legislation in all cases of discrepancy.

The occupational health and safety of workers in construction will be in compliance with Labour and Employment Act-2007, Regulation on Occupational Health, Safety and Welfare, 2012 and any other national documents. The list of the OHS requirements shall be attached along the Bill of Quantities (BoQ) along with an appropriate item description to allow the bidder to quote reasonably against the item, and to enable strict compliance and ease the monitoring during the project implementation time

2. Environmental and Socio-Economic Conditions:

(a) Geological and topographical condition

Biological Corridor (BC) 2 connects the two largest national parks in the country; namely Jigme Dorji National Park in the northern part and Jigme Singye Wangchuk National Park towards southern part. It was first designed to allow movement and/or occupancy of red panda (*Ailurus fulgens*) and musk deer (*Moschus leucogaster*). While red panda presence has been confirmed from the northern regions of this corridor, musk deer presence has not been yet confirmed from the corridor, although a habitat suitability analysis indicates presence of musk deer habitat in the north-western part of the corridor. Camera trap and occupancy surveys have confirmed the presence of tigers (*Panthera tigris*) in several places of the corridor. Thus, tiger was included as a focal species for corridor management. Two other habitat specialist landscape species, clouded leopard (*Neofelis nebulosa*) and Rufous-necked hornbill (*Aceros nipalensis*) were also included in the suite of focal species because the

corridor includes a large swathe of intact temperate broadleaf forests, which are preferred habitat for both species.

The entire area has 2769.32 hectares which can be categorized into 60 km length by 4 km minimum width. The 60 km long Biological Corridor 2 links Jigme Dorji National Park with Jigme Singye Wangchuck National Park. In the north, close to Jigme Dorji National Park, the corridor is about 6 to 7 km wide, but narrows to an average width of about 4 km as it traverses southwards. Corridor lies within the Wangdue Dzongkhag with recent validation of BC boundary. As it traverses across the mountains that separate the Punatsang Chhu-Mo Chhu and Dang Chhu and Wang Chhu drainages, the corridor crosses about 5 to 7 east-west directed mountain ranges which adds to the topographic complexity of the corridor's landscape. Most of the corridor is between 2,000 and 3,500 masl in elevation and most slopes are between 21 to 40 degrees Steep slopes are distributed through the corridor, but the southern areas of the corridor have more steep-sloped areas (Fig. 1)



Fig 1. Distribution of slope categories in Biological Corridor 2 landscape (Old map)

(b) Climatic conditions

Meteorological data has been derived from station record of Punakha (Thinlegang) and Wangduephodrang (Gasello) from Meteorology Section, Department of Hydro met Services, Ministry of Economic Affairs Thimphu (Fig 2)



Figure 2 Avg. maximum, minimum temperatures and avg. rainfall from Thinlegang weather station.

Temperature was received maximum in the year 2018 with 21.6 °C and the lowest temperature in the year 2017 with 12.15°C (Figure 2). Highest rainfall was received in the year 2013 with 3.6 mm and was received lowest in the year 2012 with 2.00 mm towards northern part of Biological Corridor C-02 (Figure 2). Northern part of Biological Corridor-02 was reference from Thinleygang meteorological data station, Punakha Dzongkhag.



Figure 3 Avg. maximum, minimum temperatures and avg. rainfall from Gasello weather station.

Towards southern part of Biological Corridor-02, maximum and minimum temperature was received in the year 2009 with 22.9 °C and 10.4 °C (Figure 10). Highest rain fall was received in the year 2009 with 2.6 mm and the lowest rainfall received was in the year 2018 with 0.99 mm (Figure 3).

(c) Hydrological conditions

There are 3 streams which flow through biological corridor 02 and finally drain out to Punatsang Chhu river but the source is beyond BC 02 boundary. Till now the management could not conduct any sort of study related to water morphology due to lack of facility such as *water testing kids* and other necessary requirements.

(d) Flora and fauna diversity.

The corridor spans across three eco-regions, notably the Eastern Himalayan Broadleaf

Forests, Eastern Himalayan Subalpine Forests, and the Himalayan Subtropical Pine Forests eco-regions. Within this hierarchical structure, the broadleaf forests can be categorized as Warm Broadleaf Forests up to about 2000m in elevation, and Cool Broadleaf Forests that grow in the higher elevations above 2000m, to about 2900 m. Other forest types include the Mixed Conifer Forests that include both broadleaf and conifers that transition to Blue Pine Forests in the higher elevations of the northern sections of the corridor. Chir Pine Forests grow in the exposed, drier slopes in the southern sections of the corridor.

There are about 40 tree species, 9 understory species, 15 species of mammal and 145 species of birds, as shown in Figure 2, recorded so far. There is also a good tiger habitat through the corridor, except for the southern regions, where it connects with Jigme Singye Wangchuck National Park. Camera trap surveys have also confirmed the presence of other wide-ranging, area-sensitive species like the common leopard (*Panthera pardus*), clouded leopard (*Neofelis nebulosa*), Asiatic black bear, and wild dog (*Cuon alpinus*) throughout the corridor. Tiger prey species, especially sambar (*Rusa unicolor*), barking deer (*Muntiacus muntjak*), and wild pig (*Sus scrofa*) have also been confirmed from throughout the corridor.

Common leopards were confirmed from about 1,900 m to 3,040 m, while wild dogs were found within a narrower range, between about 2,020 to 3,000 m. Both species are known from lower elevations in Bhutan, and elsewhere in their wide range distribution, and the sampled area extended to 1,070 m, below the minimum elevation where both species were observed.



- 1. Tiger captured in camera trap in Biological Corridor
- 2. 2. Bhutan Giant Flying Squirrel carcass during BC SMART patrolling (predation by Leopard cat)



Many of the birds recorded from the corridor have wide elevational distributions. But some, like the Common rose finch (*Carpodacus erythrinus*), Blood pheasant (*Ithaginis cruentus*), and Crimson breasted wood pecker (*Dendrocopos cathpharius*) were recorded from a narrow elevation band. Other species, such as the Himalayan Cutia (*Cutia nipalensis*), goldenbabbler (*Cyanoderma chrysaeum*), streaked laughing thrush (*Trochalopteron lineatum*), yellow cheeked tit (*Parus spilonotus*), bar-winged flycatcher-shrike (*Hemipus picatus*), Ward's

trogon. (*Harpactes wardi*), wedge-tailed green pigeon (*Treron sphenurus*), White-browed shrike- babbler (*Pteruthius aeralatus*), were only found in the lower elevations.

(e) Socio-economic conditions.

Respondents from 82 households in and around the corridor were interviewed during socioeconomic surveys conducted for the BC2 management plan. Assuming that the respondent group is representative of the human population in the corridor, the average household size is 4 members, with an average of 1.8 males to 2.3 females, for a male: female ratio of 0.76. If the respondents represent a representative demographic of the human population in the corridor, most are middle aged, being between 35 and 65 years of age (Figure 17). Most (77%) of the respondents were engaged in agriculture (Figure 18). Other livelihoods included employment, labour, and dependency on livestock. Seventy-one of the 82 households interviewed held livestock, with 70 (85%) owning cattle and twenty-three households (28%) kept poultry, but in small numbers (X = 4).

Most of the respondents practiced Kamzhing and Chuzhing agricultural practices. The extent of Tseri, or shifting cultivation, was very small. Some respondents own orchards. Sixty-one respondents grew paddy as the primary crop, while 17 grew potatoes. Other primary crops included apple, strawberry, and radish, but there were grown by very few respondents. Thirty-seven of the 82 respondents said that wildlife crop depredation was the primary issue with agriculture, and 10 said the lack of water was the primary constraint. Other issues were infertile soils, insufficient land for cultivation, lack of marketing options, lack of money to invest more in agriculture, and lack of labour. Sambar and wild pig were considered to be the primary animals responsible for crop depredation by the majority (75%) of the respondents.



New Revised map for BC-02

3. Planned activities in Y2021

The activities that are planned in BC-02 that require ESMP are:

1. Water supply to the Kamichhu range office

Kamichhu range office was completed with funding support from BFL and is located in Zawakha, in Kamichhu, Daga Gewog, Wangdue Phodrang. The site is on area of 0.402 acre which is flat and barren with Wangdue-Tsirang National Highway in the north direction. With no reliable water source for drinking, Wangdue Dzongkhag Administration was requested for their technical assistance in conducting survey and preparing estimate for construction of borewell to solve the issue. However huge cost was estimated for the activity and therefore Jaypee Group of Company was requested for their support. The company have recently agreed to drill borewell and provide steel casing free of cost and while rest of the material should be arranged from the office. The activity will involve boring of about 30 to 60m depth of ground to extract underground water. The water will be channeled through pipe and water tank will be used for storing the water. Materials required for the activity are galvanized iron pipe, HDPE pipe, cement, sand, submersible pump.

There will be 5 to 6 temporary workers. About 5000 to 6000 litres of water is expected to be used during the construction period. The water for during construction will be sourced from river and other source. Solid waste such as construction material, garbage and food waste will be generated during the construction. Noise disturbance is expected during the construction period from the plant operations, heavy equipment and with increase in traffic. There are offices and guest house of PHPA-II Project on the other side of Punatsangchhu River which is about 120 m aerial distance from the Kamichhu range office but they will not be impacted by this construction.

The activity was expected to start from 1st Quarter of 2021 till 2nd quarter of 2021 with budget approval of Nu. 0.50 million from PCU. Since the activity is inside the registered land of the office, there will be minimal disturbance to the wildlife and surrounding area. Following are the pictures of the Kamichu range office.



2. Construction of Black-necked Crane Observation Deck

The construction of BNC observation deck measuring 0.10 acre will be done in Langlaygang Menchu Yusa Chiwog, Gangtey Gewog, Wangdue Phodrang with the budget of Nu. 0.140 million. The site is near 4km Gangtey-Phobji Nature trail which is used by the locals as well as tourist. The site offers excellent view of the Gangtey-Phobji RAMSAR site and for bird watching. There is also a canopy for resting. Around 5 to 6 temporary workers will be engaged during the construction mostly from the Gangtey and Phoji Gewog community.

There are no households nearby the site and there won't be any disturbance from the activity. The observation deck will be made from wood overlooking the RAMSAR area. The activity

will commence and complete in 2nd quarter of 2021.

Solid waste such as construction material, garbage and food waste will be generated during the construction. Nails, wooden planks and blocks will be mostly used for the activity. Since the activity is on small scale employing local people, it will have minimal impact to the wildlife or no Human wild life conflict as it is near the nature trail.



3. Maintenance of Forest Office including site development (Gangtey-Phobji)

The forest office namely Gangtey-Phobji Beat office and Gogona FMU office measuring 2.718 acre is located in Tabiding, Gangtey Gewog, Wangdue Phodrang Dzongkhag. The activity has site development with development of parking area, fencing and gate installation with an estimated cost of Nu.0.756 million. Around 7 to 8 temporary workers will be engaged in the activity. Solid waste such as construction material, sewage sludge, garbage and food waste will be generated during the construction. There will be less noise from fencing works as it won't need heavy machine and machine work will be very less for site development also.

There are around 10 households in the vicinity, but they will not be impacted by this construction. The settlement in the vicinity is private Resort, office of National Seed Centre Dewachen Resort and Phobjikha Central School along with some private land. The site is on gentle slope, marshy and is adjacent to the Gangtey-Phobji RAMSAR site.

For fencing and construction of gate laying of foundation trenches, cement work, steel work, providing & fixing G.I chain-link mesh and laying reinforced cement concrete will be involved. For the site development, laying hammer dressed stone including excavation, refilling and disposal of surplus earth, construction of approach road and parking area, earth work, cement work and excavation in foundation trenches or drains.



In picture: area for parking development

4. Maintenance of Forest Office including site development (Khotokha)

The Khotokha Forest Management Unit Office looks after the Khotokha RAMSAR site. The office is in need of compound fencing. The office has an area of 0.346 acre located in Gangrichen village, Bjenag Gewog, Wangdue Phodrang. There will be 5 to 6 temporary workers involved for the work. About 3000 to 4000 litres of water is expected to be used during the construction period. The water for during construction will be sourced from the office. Solid waste such as construction material, sewage sludge, garbage and food waste will be generated during the construction. Minimal noise disturbance as the work will involve construction of compound fencing with barbed wire and entrance gate. Registered land of Rinchenling Shedra is located nearby along with sawmill adjacent to the forest office towards



southwest. However, they will not be impacted by this activity. The activity is to be implemented in the 1st quarter of 2021 and expected to be finished by the 2nd quarter of 2021.

the site has gentle slope with Blue pine forest in the upper side. Materials to be used are barbed wire, chain link, stone, cement and sand for the maintenance work. There is no adverse impact to the surrounding as the activity is on small scale and the activity only includes fencing within the registered land of the office. No felling of large trees will be carried out in the area apart from clearing of bushes for installing fencing posts.

4.Environmental and Social Impacts and Mitigation Measures

Activity 1: Water Supply to Kamichhu Range Office

Potential impact	Impact scale	Proposed mitigation measures	Responsible party	Costs
<i>Waste</i> : generation of waste as a result of construction activities	Short term Minor	<i>Pre-construction:</i> requirements for appropriate waste management should be included in the bidding documents, as a precondition for the contractor's selection	BFL focal person in [BC- 02]	To be included in the bidding document
		 During construction: Identification of the different waste types at the project site (soil, asphalt, food, etc.); Ensure that camps are located away from existing stream, river, or water sources, and that no discharge from camps is made into nearby water bodies; Proper containers/waste bins should be provided at the project site; Dumping of waste on the sides of the road, on private land, or in other non-designated places should be prohibited; 	BFL focal person in [BC- 02] Contractor	
		 Dumping waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; Collection, transportation and final disposal of all waste should be undertaken regularly [weekly] The options for reuse/recycling of the generated waste streams should be taking into consideration (e.g. excavated soil, etc.). <i>After construction:</i> All waste shall be removed from the project site. 	BFL focal person in [BC- 02] Contractor	
Human-wildlife conflict: construction is always carried out in multi-purpose areas, where human- wildlife conflict is	Short term Minor	During construction: Proper signs shall be placed in the vicinity of project sites Project site area shall be clearly demarcated and workers shall not be	BFL focal point in [BC-02] Contractor	To be included in the bidding documents To be

minimal		allowed to enter any wildlife areas		included in
		Feeding animals shall be prohibited		document
Workers' health and safety including COVID (Refer to the full OHS guidelines attached where ever relevant)	Short term Minor	 Feeding animals shall be prohibited Comply with the workers' health and safety guidelines Ensure regular health screening for the workers pre and during construction activities Ensure that no underage workers, or children are engaged Ensure decent work conditions, including an appropriate salary, working hours, accommodation and food for workers shall be provided to all workers Ensure that workers are employed on the principle of equal opportunity and 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 	BFL focal point in [BC-02] Contractor	the bidding document From the activity cost
		 employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Implement a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns Strictly abide by COVID prevention protocols (use masks, maintain distance weak handa regularly ato.) 		

Activity2:	Construction	of BNC	observation Deck
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Potential impact	Impact scale	Proposed mitigation measures	Responsible party	Costs
<i>Waste</i> : generation of waste as a result of construction activities	Short term Minor	 <i>Pre-construction:</i> requirements for appropriate waste management should be included in the bidding documents, as a precondition for the contractor's selection <i>During</i> construction: Identification of the different waste types at the project site (soil, asphalt, food, etc.); 	BFL focal person in [BC- 02]	To be included in the bidding document

		 Ensure that camps are located away from existing stream, river, or water sources, and that no discharge from camps is made into nearby water bodies; Proper containers/waste bins should be provided at the project site; Dumping of waste on the sides of the road, on private land, or in other non-designated places should be prohibited; Dumping waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; Collection, transportation and final disposal of all waste should be undertaken regularly [<i>specify:</i> weekly] All construction materials should be covered during the transportation to avoid waste dispersion; The options for reuse/recycling of the generated waste streams should be taking into consideration (e.g. excavated soil, etc.). Burning of construction waste should be prohibited. 	BFL focal person in [BC- 02] Contractor BFL focal person in [BC- 02] Contractor	
Workers' hoski		project site.		
Workers' health and safety including COVID (Refer to the full OHS guidelines attached where ever relevant)	Short term Minor	 Comply with the workers' health and safety guidelines Ensure regular health screening for the workers pre and during construction activities Ensure that no underage workers, or children are engaged Ensure decent work conditions, including an appropriate salary, working hours, accommodation and food for workers shall be provided to all workers Ensure that workers are employed on the principle of equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment 	BFL focal point in [BC-02] Contractor	To be met from activity cost

and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.	
 Implement a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns Strictly abide by COVID prevention 	
distance, wash hands regularly etc.)	

Potential impact	Impact scale	Proposed mitigation measures	Responsible party	Costs
<i>Waste</i> : generation of waste as a result of construction activities	Short term Minor	<i>Pre-construction:</i> requirements for appropriate waste management should be included in the bidding documents, as a precondition for the contractor's selection	BFL focal person in [BC-02]	From the activity cost
		During construction:		
		• Identification of the different waste types at the project site (soil, asphalt, food, etc.);		
		• Ensure that camps are located away from existing stream, river, or water sources, and that no discharge from camps is made into nearby water bodies;	BFL focal	
		 Proper containers/waste bins should be provided at the project site; 	[BC-02]	
		• Dumping of waste on the sides of the road, on private land, or in other non-designated places should be prohibited;	Contractor	
		• Dumping waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived;		
		 Collection, transportation and final disposal of all waste should be undertaken regularly [<i>specify:</i> weekly] 		
		• All construction materials should be covered during the transportation to avoid waste dispersion;		
		• The options for reuse/recycling of the generated waste streams should be taking into consideration (e.g. excavated soil, etc.).	BFL focal person in [BC-02] Contractor	
		• Burning of construction waste should be prohibited.		

Activity3: Maintenance of Gangte-Phobji Forest Office including site development

		After construction:		
		All waste shall be removed from the project		
		site.		
Workers' health	Short term	 Comply with the workers' health and safety guidelines 	BFL focal	From the
<i>including COVID</i>	Minor	 Ensure regular health screening for the workers pre and during construction activities 	[BC-02] Contractor	activity cost
OHS guidelines attached where ever		• Ensure that no underage workers, or children are engaged		
relevant)		• Ensure decent work conditions, including an appropriate salary, working hours, accommodation and food for workers shall be provided to all workers		
		• Ensure that workers are employed on the principle of equal opportunity and 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, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.		
		Implement a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns		
		Strictly abide by COVID prevention		
		protocols (use masks, maintain distance,		
		wash hands regularly etc.)		
		<i>Pre-construction:</i> requirements to limit emissions should be included in the bidding	BFL focal	
		documents, as a precondition for the	[BC-02]	
		contractor's selection	Contractor	
		During construction:		
		-Construction site, transportation routes and		
		materials handling sites should be water-		
Dust production	Short- term:	sprayed on dry and windy days;		
change	Minor	-Construction materials should be stored in		
		appropriate and covered places to minimize		
		dust;		
		-Before allowing vehicles on site, fitness and		
		emission test of the vehicle shall be		
		performed;		
		-Vehicle loads likely to emit dust need to be		

		covered;		
		-Workers should wear protective masks if		
		dust appears;		
		-Vehicle speed should be restricted within		
		the construction site;		
		-Regular maintenance of the vehicles and		
		construction machinery should be performed		
		in order to reduce any leakages of motor		
		oils, emissions and dispersion of pollution;		
		-Burning of debris from ground clearance shall be prohibited.		
		-Requirements to limit emissions should be	BFL focal	
		included in the bidding documents.	person in [BC-02]	
		-The construction work should not be		
		permitted during the nights, the operations	Contractor	
Noise disturbance	Short-	on site shall be restricted to the hours 7am—		
	term;	7pm;		
	Minor	-Vehicles that are excessively noisy shall not		
		be operated until corrective measures have		
		been taken;		
		-Earplugs and protecting devices shall be provided to workers on site.		

Activity 4: Maintenance of	of Khotokha FM	U office includin	g site development
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Potential impact	Impact scale	Proposed mitigation measures	Responsible party	Costs
<i>Waste</i> : generation of waste as a result of construction activities	Short term Minor	<i>Pre-construction:</i> requirements for appropriate waste management should be included in the bidding documents, as a precondition for the contractor's selection <i>During</i> construction:	BFL focal person in [BC-02]	To be included in bidding document
		 Identification of the different waste types at the project site (soil, asphalt, food, etc.); Ensure that camps are located away from existing stream, river, or water sources, and that no discharge from camps is made into nearby water bodies; Proper containers/waste bins should be provided at the project site; Dumping of waste on the sides of the road, on private land, or in other nondesignated places should be prohibited; Dumping waste shall be prohibited on fragile slopes, forests, religious or other 	BFL focal person in [BC-02] Contractor	

		 livelihood is derived; Collection, transportation and final disposal of all waste should be undertaken regularly [<i>specify:</i> weekly] All construction materials should be covered during the transportation to avoid waste dispersion; The options for reuse/recycling of the generated waste streams should be taking into consideration (e.g. excavated soil, etc.). Burning of construction waste should be prohibited. After construction: All waste shall be removed from the project site. 	BFL focal person in [BC-02] Contractor	
Workers' health and safety including COVID (Refer to the full OHS guidelines attached where ever relevant)	Short term Minor	 Comply with the workers' health and safety guidelines Ensure regular health screening for the workers pre and during construction activities Ensure that no underage workers, or children are engaged Ensure decent work conditions, including an appropriate salary, working hours, accommodation and food for workers shall be provided to all workers Ensure that workers are employed on the principle of equal opportunity and 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, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Implement a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns Strictly abide by COVID prevention protocols (use masks, maintain distance, wash hands regularly etc.) 	BFL focal point in [BC- 02] Contractor	From the activity cost
Dust production and air quality change	Short- term; Minor	Pre-construction: requirements to limitemissions should be included in the biddingdocuments, as a precondition for thecontractor's selectionDuring construction:-Construction site, transportation routes and	BFL focal person in [BC-02] Contractor	

		materials handling sites should be water-		
		sprayed on dry and windy days;		
		-Construction materials should be stored in		
		appropriate and covered places to minimize		
		dust;		
		-Before allowing vehicles on site, fitness and		
		emission test of the vehicle shall be		
		performed;		
		-Vehicle loads likely to emit dust need to be		
		covered;		
		-Workers should wear protective masks if		
		dust appears;		
		-Vehicle speed should be restricted within the		
		construction site;		
		-Regular maintenance of the vehicles and		
		construction machinery should be performed		
		in order to reduce any leakages of motor oils,		
		emissions and dispersion of pollution;		
		• -Burning of debris from ground clearance shall be prohibited.		
		-Requirements to limit emissions should be	BFL focal	
		included in the bidding documents.	person in	
		-The construction work should not be	[BC-02]	
		permitted during the nights, the operations on	Contractor	
	Short-	site shall be restricted to the hours 7am-		
Noise disturbance	term;	7pm;		
	Minor	-Vehicles that are excessively noisy shall not		
		be operated until corrective measures have		
		been taken;		
		• -Earplugs and protecting devices shall be provided to workers on site.		

5. ESMP Implementation arrangements

The implementation of project activities will be carried out by the BFL focal person in BC2. The focal person will be responsible for compliance with all procedures outlined in this ESMP, as well as 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 PA will sign with the Contractor(s) for implementation of the planned activities in BC-2 in 2021. The Contractor is 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 for all workers prior start the project activities and prior any specific tasks with high health risks.

The Supervising Engineer for BC-2 needs to monitor the implementation of proposed measures by the Contractor and Contractor's subcontractors with visual checking, reviewing the records of evidence that the measures have been applied and ask the Contractor to apply the measures as soon as possible. Non-compliances should be recorded and the Report on any non-compliances should be reported to the ESS officer immediately, and the ESS officer will report it to the PCU (M&E Officer). Each non-compliance should be closed with appropriate measure/s and the evidence should be kept.

Disbursement of project funds to the BC will be contingent upon their full compliance with the safeguard's requirements

6. ESMP monitoring arrangements

The BFL focal person in BC-02 will closely monitor the implementation of all planned activities and the required mitigation measures, and ensure that they fully comply with this ESMP and with the terms and conditions included in the environment clearances issued by RGoB's national authorities.

BC-02 is also fully responsible for the compliance of all external contractors and service providers working in the BC-02 with the safeguard requirements outlined in the ESMP.

Sl.No	Activities	Monitoring team	Timeline		Location	Means of Verification
			Start	Complete		
1	Water supply to Kamichhu Range office	Field focal	January	May	Zawakha, Daga Gewog, Wangdue	Field visit
		ESS officer	2 nd week of May, 2021			
2	Construction of BNC Observation Deck	Field focal	April	June	Langlaygang Menchu Yusa Chiwog, Gangtey	Field visit
		ESS officer	2 nd week of May, 2021		Gewog, Wangdue Phodrang	
3.	Maintenance of Gangte-Phobji Forest Office including site development	Field focal	Jan	June	Tabiding, Gangtey gewog, Wangdue	Field visit
		ESS officer	2 nd week of May, 2021			
4	Maintenance of Khotokha Forest Office including site development	Field focal	Jan	June	Gangrichen, Bjenag Gewog, Wangdue	Field visit
		ESS officer 2 nd week of May, 2021				

The monitoring of activities under this ESMP will be carried out in the following manner:

1. Water supply to Kamichhu Range office

Monitoring by implementing entities:

- At least weekly field visits
- Monthly reports prepared by implementing entities and submitted to ESS officer

Monitoring by ESS officer:

- Field monitoring by ESS officer monitoring of the work once during the implementation and through field report from IAs after completion of the work.
- Reports by ESS officer to BFL Fund Secretariat Annual report submitted to the BFL Fund Secretariat in January, 2022.

Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)

2. Construction of BNC Observation Deck

Monitoring by implementing entities:

- At least weekly field visits
- Monthly reports prepared by implementing entities and submitted to ESS officer

Monitoring by ESS officer:

- Field monitoring by ESS officer monitoring of the work once during the implementation and through field report from IAs after completion of the work.
- Reports by ESS officer to BFL Fund Secretariat Annual report submitted to the BFL Fund Secretariat in January, 2022.

Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)

3. Maintenance work at Gangte-Phobji Forest Office and Khotokha Forest Office

Monitoring by implementing entities:

- At least weekly field visits
- Monthly reports prepared by implementing entities and submitted to ESS officer

Monitoring by ESS officer:

- Field monitoring by ESS officer monitoring of the work once during the implementation and through field report from IAs after completion of the work.
- Reports by ESS officer to BFL Fund Secretariat Annual report submitted to the BFL Fund Secretariat in January, 2022.

Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)

7. Capacity Need and Budget

Activities under this ESMP will be implemented by the BFL focal person, supervising engineer, and a contractor that will employ workers as mentioned in the contract agreement.

The budget for each of the activities is:

(i). Water supply to Kamichhu range office: Nu. 0.50 million

(ii). Construction of BNC observation deck: Nu. 0.140 million

(iii). Maintenance of Gangtey-Phobji Forest Office including site development: Nu. 0.756 million which includes Nu. 50,000 for ESMP mitigation measures and work charge of site engineer

(iv). Maintenance of Khotokha Forest Office including site development: Nu. 0.418 million which includes Nu. 50,000 for ESMP mitigation measures and work charge of site engineer

8. Consultation and Disclosure Mechanisms

This ESMP has been prepared in a participatory manner, and approval from community representative has been given on 06/10/2020 in Gangtey Gewog regarding the construction of BNC observation deck and to inform local communities regarding the planned project activities, solicit their opinions, and enable them to question proposed mitigation measures.

As for the water supply to the Kamichhu Office is within the registered land of the Wangdue forest division and no community is in the vicinity, community consultation was no needed. Subsequent approval will be sought from the Wangdue Dzongkhag Administration for borewell construction.

Since the maintenance of forest office in Gangtey-Phobji and Khotokha is within the registered land and activity is on small scale, community consultation was not needed. for the construction.

Since there is no community in the vicinity, no consultations were conducted for the activities. However prior permissions/ approval will be sought from the relevant agencies for implementing the work. Copy of the same will be attached to the ESMP.

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 PA Management Office and at the PCU Office.

9. Stakeholder engagement plan

The local community that resides in the vicinity of the planned BFL activities in BC-2 will be engaged throughout the implementation of these activities where ever relevant.

The BFL focal person has to submit the official minutes of consultation meetings (along with a list of participants, disaggregated by gender and age) to ESS officer s within one week after the completion of the consultation.

The ESS officer s 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.

Annex 1. Community consultation minutes



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	Plot No	Area	Plot Name.	Land Type	Purpose	Remarks
1		0.50	Yusa.	Institutional land	For construction of camp site with restroom on LUC	
2		0-10	Kanglas gang Manchur.	Institutional land	For construction of BNC observation deck on LUC	For allotment on Land Use Certificate (LUC) in favor of Wangdue Forest Division.
3						
		0		0		
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			Jun Jag			

Annexure II. BFL: SUGGESTED 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)¹ 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.
- 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 stall 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. Legionnella pneumophilia) or breeding of vectors (e.g. mosquitoes and flies) of public health concern.

2. <u>Information Provision on Occupational Health and Safety (OHS)</u>

- 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. <u>Physical Hazards</u>

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 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' accommodation²

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

- 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 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.

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