

Bhutan for Life

Environmental and Social Management Plan for Biological Corridor 3, Tsirang (2022)

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;
- 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.

1. (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 RGoBLaws 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.

(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 (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.

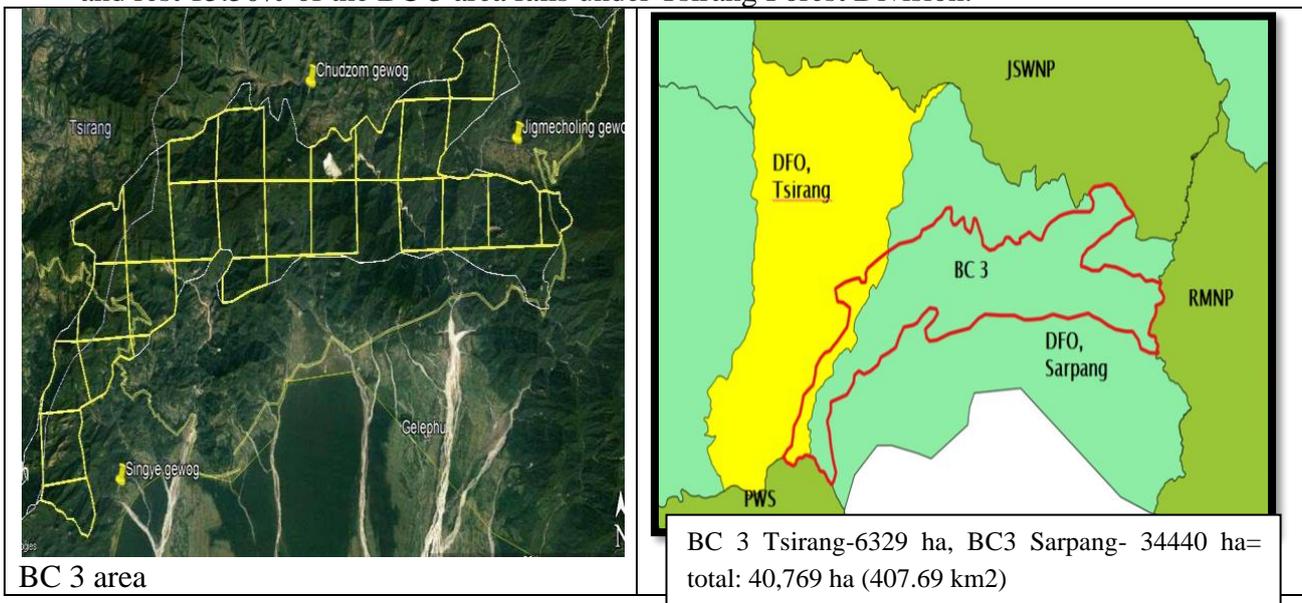
In general, RGoB's laws, policies, and guidelines are in line with the WWF's environmental and social safeguards requirements. However, there are a few differences between the two systems. With regard to environmental impacts, there are no direct contradictions between the RGoB laws and regulations and 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.

2. Environmental and Socio-Economic Conditions: BC 3

Geographical Location

BC-3 has a total area of 407.69km² with elevation range of 440-2300masl and it is exactly located between JSWNP-RMNP in the North-east to Pibsoo Wildlife Sanctuary in the south-west under Sarpang district. About 84.50% of BC (03) falls within Sarpang Forest Division and rest 15.50% of the BC 3 area falls under Tsirang Forest Division.



Climatic conditions

BC 3 (Tsirang) is located in one of the ecological zones of Bhutan with pleasant summer and relatively warmer during winter. The climatic condition in lower elevation adjoining Phibsoo wildlife sanctuary (PWS) is hot and humid in summer, while the climatic condition in the northern part of BC 3, adjoining Jigme Singye Wangchuck National Park (JSWNP), is cool and moderate.

Hydrological conditions

In general, Tsirang receives monsoon rainfall only by 2nd week of June every year. The rainfall is fed by South West monsoon from Bay of Bengal. However, BC 3 does receive seasonal rain in spring (April-May) from westerly disturbance with lightning and thunder. These seasonal rains provide favourable condition for the vegetation growth and food for wildlife. The

moisture loaded wind from the South get cooler and provide maximum rainfall in Darachu, Patshaling Geog and Dunglagang Geog, while rest of the Geogs in Tsirang receive less rainfall as they fall in rain shadow area. BC 3 receives maximum rain in July month averaging more than 1000 mm and least rainfall in winter month (less than 150 mm). The springs and small rivers in Tsirang are fed by summer rain, usually flow of water in all tributaries increases with the arrival of monsoon and recede during lean season (winter months).

Flora and fauna

The forest types of the BC 3 (Tsirang) can be described as predominantly broadleaf. Broadleaf is the largest forest type at 76.48 % of the land area. Chir pine forest with 4.20%, and mixed conifer forests found at the outer reaches of the Dzongkhag stand at about 6.71 % (LCMP, 2010). The other significant vegetation is the shrubs at 3.30%, which is spread along the mountain slope bordering JSWNP in the north of the district.

The BC-3 is adorned with subtropical forest with abundant hardwood trees. It enjoys hot rainy summer and cold winter seasons. The diversity of the flora and fauna is rich. Total of 180 species from 39 NFI grids further classified into four major habitats were recorded, i.e. majority of the birds species were recorded from warm broadleaved forest (n = 64), followed by riverine (n = 51), agriculture (n = 35), and sub-tropical forest (n = 30).

BC-03 is dominated by barking deer (n = 99), followed by wild pigs (n = 80), sambar deer and elephant (n = 70) each. This shows that barking deer, wild pigs and sambar deer had wide ranges of habitat uses within the different elevation and habitat types. Some of the critically endangered bird species in BC 3 are White Bellied Heron, Rufous Necked Hornbill.

Socio-Economic conditions

BC-03 covers 2 Dzongkhags (Sarpang and Tsirang). It encompasses 7 Gewogs [Senge, Chudzom, Gelephu, Samtenling, Dekiling, Shershong and Gakidling] under Sarpang and 2 gewogs [Patshaling and Dunglagang (23 household of Tsakaling chiwog under Patshaling Geog resides within 2km distance)] under Tsirang. 1664 households and 106 households of Sarpang and Tsirang respectively depend on BC-3.

Peoples in Sarpang and Tsirang mostly speak Lhotsamkha, Sharchop and Dzongkha. Primary income sources for the public are from livestock and agriculture products. People residing within the vicinity of BC 3 Tsirang do subsistence farming, majority of the people earn their livelihood through vegetable farming as their area is favourable for vegetable production. Most of the households rear livestock, poultry and cardamom plantation to earn cash income.

3. Planned activities in Y 2022 and 2023 for BC3_Tsirang

Activities that are planned in BC 3 in 2022 and 2023 are:

Activity 1. Construction of Range Office cum residence at Mendrelgang

Location: Pemashong (old Dungkhag Office)

Implementation period: July 2022 to June 2023

Budget: 5.4 million (Nu)

The proposed activity involves clearing of bushes and 4 numbers of *Schima Wallchii* poles from the 30 decimal area of the total 1-acre land. Approach road will be constructed from range office until reaching school junction to connect the range office to the main road. The land has gentle slope and it is barren without any trees. The land where construction of approach road will take place is registered land belonging to divisional forest office of Tsirang. Compound fencing will not impact any wild animal since the fencing will be done around the registered land of office construction. The fencing will be carried out in the settlement area where the wild animals are not found.

The planned activity under BFL funding during the year 4 and 5 entails construction of Range Office, 2-unit staff quarter, approach road, parking space, retaining wall, compound fencing and lighting system. The construction work for the planned activity will be tendered through government procurement system and the successful bidder will be awarded the construction work based on the technical estimate prepared by the supervising engineer. The materials and specification as per BoQ (bill of quantities) will be followed and strictly monitored during the construction phase. The resource for the construction activity includes stones/boulders, aggregates, sand, bricks, cement, timbers, CGI sheets, iron rods, etc which the contractor will purchase for the work. The contractor will be engaging 10 numbers of skilled workers mainly carpenter, mason, plumber, and electrician. The contractor will be allocated appropriate site for construction of temporary huts, toilet and bathroom for the workers and site for storage of construction materials. The water for the construction work and for the workers will be tapped from rural water supply scheme of Mendrelgang Geog.

Some of the potential environmental and social impacts could be the following:

- a. Waste generated from construction site;
- b. Worker's health and safety;
- c. Noise and dust pollution;
- d. Possible disturbance to the school (Mendrelgang Primary School) and neighbors.

3. Mitigation Measures for Environmental and Social Impacts

Potential impact	Impact scale	Proposed mitigation measures	Responsible Party	Costs (million)
<i>Activity 1: Construction of Range Office and 2 Unit staff quarter, parking and approach road, retaining work and barbet wire fencing</i>				Nu. 5.4 m
Noise disturbance: Possible noise disturbance as a result of outdoor equipment usage and transportation vehicles driving around the construction site	Short term minor	<ul style="list-style-type: none"> • Pre-construction: requirements to limit noise pollution should be included in the bidding documents, as a precondition for the contractor's selection • Noise screening at construction site as part of bidding document • During the construction: The construction work should not be permitted during the nights, the operations on site shall be restricted to the hours 7am—7pm • 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 if necessary • Minimize noise disturbance to school by providing screening nets/CGI sheets along the road 	BFL focal person (BC 3) Contractor	To be part of contract agreement Will be met from the activity cost.
Air quality: dust as a result of construction works and possible emissions from transportation vehicles	Short term minor	<ul style="list-style-type: none"> • Pre-construction: requirements to limit emissions should be included in the bidding documents, as a precondition for the contractor's selection • During Construction: Construction materials should be stored in appropriate and covered places to minimize dust; • 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 	BFL focal person (BC 3) Contractor	To be part of contract agreement from the activity cost.

		performed in order to reduce any leakages of motor oils, emissions and dispersion of pollution;		
Waste: generation of waste as a result of construction activities	Short term minor	<ul style="list-style-type: none"> • Pre-construction: requirements for appropriate waste management should be included in the bidding documents, as a precondition for the contractor's selection; • During construction: 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 of waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas • Collection, transportation and final disposal of all waste should be carried out on a daily basis and not left in the protected areas • All construction materials should be covered during the transportation to avoid waste dispersion • Burning of construction waste should be prohibited. • After the construction: All waste shall be removed from the project site. 	BFL focal person (BC 3) Contractor	To be part of contract agreement from the activity cost.
Workers' health and safety	Short term minor	<ul style="list-style-type: none"> • Comply with the workers' health and safety guidelines • Access to health facilities for the workers engaged in the construction activities need to be made available and ensure first aid kit is available at construction site all the time. Basic health unit (BHU) needs to be available in walkable distance or the workers need to be checked once in a month by authorized medical doctor. • Ensure decent work conditions, including an appropriate salary, working hours, accommodation and other essential amenities as per the Operational 	BFL focal person (BC 3) Contractor	To be part of contract agreement from the activity cost.

		<p>Health and Safety Guidelines are available for workers.</p> <ul style="list-style-type: none"> • 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, and disciplinary practices. • Implement a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns- the worker with grievance shall report in their grievance to Primary Grievance Officer/Secondary Grievance Officer/ Range Officer Mendrelgang/ Division HQ Damphu. All workers shall be briefed about the GRM before the start of the work. 		
COVID-19 related risk	Short term minor	<ul style="list-style-type: none"> • Follow Covid19 safety protocols circulated by Ministry of Health (MoH). 	BFL focal person (BC 3) Contractor	
Conflict between temporary workers and local communities	Short term minor	<ul style="list-style-type: none"> • Workers shall be made aware of local culture and traditions, as well as the legal consequences of harassment and intimidation, especially with regards to sexual harassment and gender-based violence. • Local communities shall be made aware of the engagement of temporary workers in project sites. • Strict monitoring shall be carried out to ensure conflicts are minimized. 	BFL focal person (BC 3) Contractor	To be part of contract agreement from the activity cost.
Disturbance to the school and neighbor	Short term Minor	<ul style="list-style-type: none"> • Provide green net/ CGI Sheet fence as screening to the school. • Contractor has to deploy man power to control traffic if need be. • Spray water daily (morning and afternoon) to prevent dust pollution • Avoid use of noisy machineries during the class hours 		

4. ESMP Implementation Arrangements

The implementation of project activities (*Construction of Range Office cum residence, parking and approach road, retaining work and barbet wire fencing*) will be carried out by the BFL focal person in BC 3. 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 3 in 2022 and 2023. 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 to starting the project activities and prior any specific tasks with high health risks following Covid19 protocol and safety measures.

The BC 3 Supervising Engineer 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-compliance 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 PA will be contingent upon their full compliance with the safeguard's requirements.

5. ESMP Monitoring Arrangements

Protocol for monitoring of activities under this ESMP will be carried out as follow;

SI #	Activities	Monitoring team	Timeline		Location	Means of Verification
			Start	Complete		
1	<i>Construction of Range Office cum residence, parking and approach road, retaining work and barbet wire fencing</i>	Field Focal	July 2022	June 2023	Pemashong, Mendrelgang, Tsirang	Work progress report,
		ESS focal	Oct 2022	June 2023		

The BFL focal person in BC 3 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. BC3 PA is also fully responsible for the compliance of all

external contractors and service providers working in the BC3 with the safeguard's requirements outlined in the ESMP.

Activity 1: Construction of Range Office cum residence, parking and approach road, retaining work and barbet wire fencing

Monitoring by implementing entities:

during the intervention and then monthly as part of the compliance monitoring – monthly starting July 2022. Reports by the implementing entities submitted to ESS officer on monthly basis during the intervention till completion June 2023.

Monitoring by ESS officer:

Twice during the construction phase (October 2022 and June 2023) – Reports by ESS officer to the PCU (M&E officer) within two weeks after the field visit and for semi-annual reporting- 15th October 2022 and 15th June 2023.

Quarterly reports by PCU (M&E officer) to Secretariat: 20 Dec 2022

Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)- 30 Dec 2022 and June 2023

6. Capacity Need and Budget

Activities under this ESMP will be implemented by the BFL focal person, supervising engineer/staff, and a contractor that will employ workers as mentioned in the contract agreement. Activities under this ESMP will be implemented by the BFL focal person, supervising engineer, and a contractor. The budget for construction of Range Office cum residence, approach road, parking and compound development works is scheduled as per the BFL activity plan in the 4th year 2022. The budget for the activity as per the technical estimate prepared by the Dzongkhag Engineer is Nu. 5.4 million.

- *The budget for each of the activities is: (last section)*

SI#	Activity	Amount (Nu.)	Budget for ESS mitigation
1	<i>Construction of Range Office cum residence, parking and approach road, retaining work and barbet wire fencing</i>		
a	Construction of Range Office cum Residence	3.34	<i>To be part of contract agreement from the activity cost.</i>
b	Construction of access road and parking space	0.334	
c	Construction of retaining wall	0.829	
	Construction of barbed wire fencing	0.322	
e	Electrical work	0.552	
	Total	5.437	

7. Consultation and Disclosure Mechanisms

This ESMP which is being prepared for the construction of Range Office with staff quarter, parking and approach road and compound development works will be shared with relevant stakeholders namely; community residing nearby the construction site, School and local government (Geog) will be consulted in a participatory manner. The community and LGs will be discussed with on the planned activities, solicits their opinions, impact and mitigation measures in placed so as to avoid any complication in future. The tentative public consultation is planned on 2nd week of February 2022. Any issues raised during the consultation meeting will be documented and appropriate mitigation measures will be addressed.

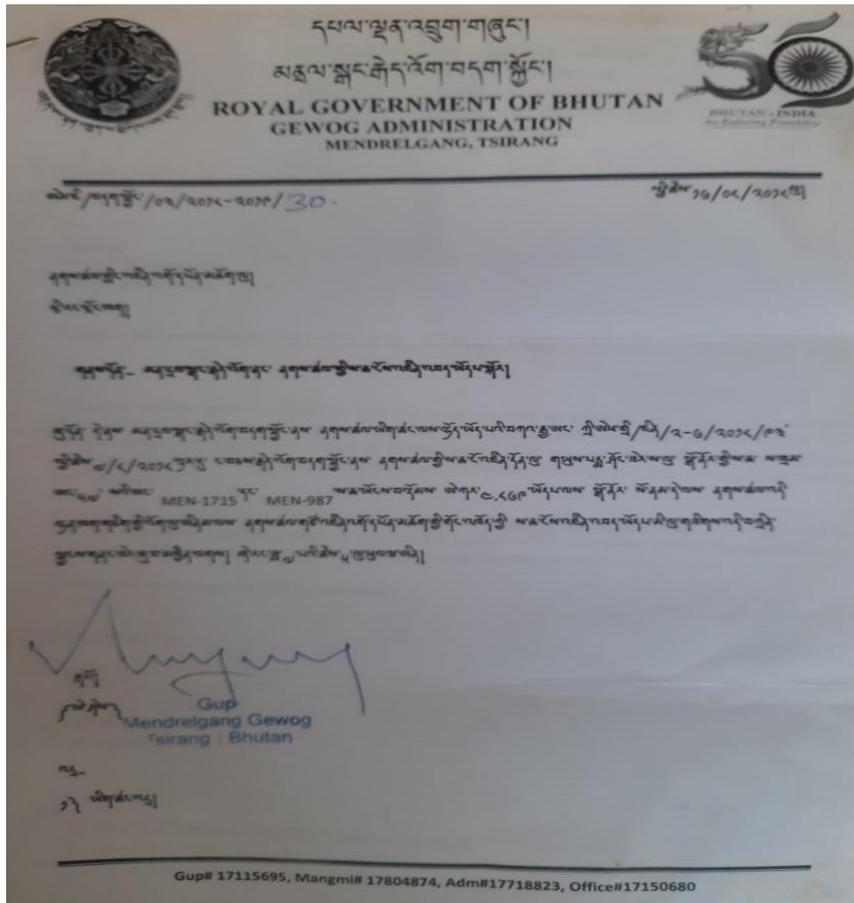
8. Stakeholder Engagement Plan

The local community that resides in the vicinity of the planned BFL activity adjoining BC3 will be engaged throughout the implementation of the construction and infrastructure development (construction of Range Office cum residence). Since the proposed construction activity is planned outside the BC3, the local community residing around the construction site will be consulted on the planned activity that will be implemented in 2022 & 2023. However, with the Covid19 restriction and election guidelines in placed, public gathering is restricted till January 2022, the public consultation with the local government and nearby public will be done once the election is over by then.

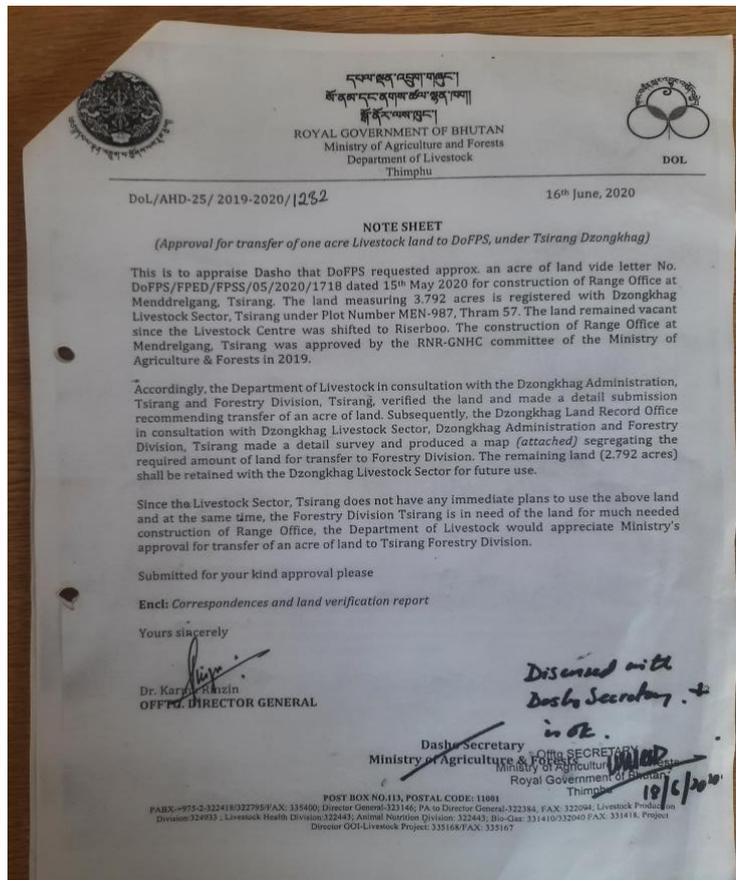
- February-March 2022, Gup office Mendrelgang for construction of Range Office at Pemashong Chiwog
- School and nearby resident-March 2022. The local community and school will be consulted on the upcoming infrastructure plan, Impact and mitigation measures, occupation health and safety protocols, conflicts and resolution, grievances redressal mechanism, etc.

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 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. The participant list and the consultation minutes shall be shared to PCU while submitting the physical progress report at later stage.

Annexure 1: Geog endorsement and recommendation



Annexure 2: Ministry approval for land acquisition



Annexure 3: Approved land ownership and cadastral map of National Land Commission



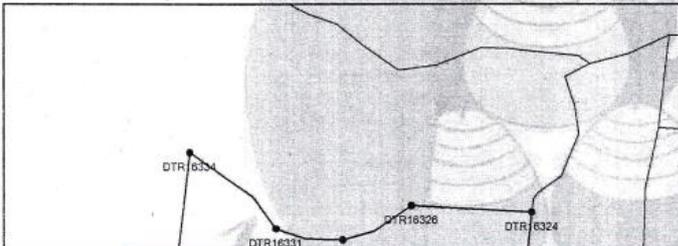
རྒྱལ་ཡོངས་ས་ཚུན་ཚོགས་པ།
ལུག་ཁྲུམ་པ།



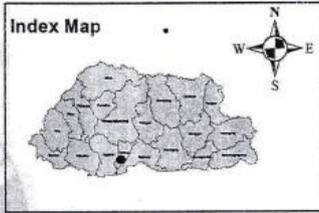
ས་འཛིན་ལྷན་ཁྲིམས་པ།	རྒྣམས་ཚལ་དང་གྲིང་གཤམས་ཏོག་ལས་ཁུངས་
ལྷན་ཁྲིམས་པ།	ལྷོ་རང་།
ལྷན་ཁྲིམས་པ།	མན་པལ་རྒྱུད་།
ལྷན་ཁྲིམས་པ།	༩༩༩
ལྷན་ཁྲིམས་པ།	གཞུང་གཞུག་ལྷོ་



ས་འཛིན་པ།	ས་འཛིན་པ།	ས་འཛིན་པ།	ས་ཚུན་ལྷན་པ།
MEN-2563	གཞུང་གཞུག་ལྷོ་	གཞུང་གཞུག་ལྷོ་	2,000
ལྷན་ཁྲིམས་པ།			



Index Map



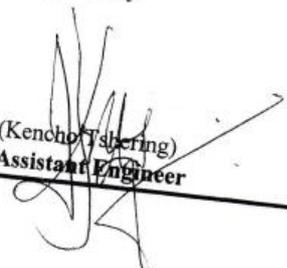
Annexure 4: Details estimates of Dzongkhag Engineering Sector

Name of Work: Construction of Range Office cum Residence
Location: Mendrelgang Gewog
Title: Cost Summary

Sl.No.	Activities	Estimated Amount	Remarks
1	Construction of Range office cum Residence(Civil) Nu:	33,99,575.16	
2	Const. of Road and Parking Nu:	3,34,245.79	
3	Construction of Retaining wall Nu:	8,29,383.44	
4	Construction of Barbed wire fencing Nu:	3,22,339.62	
5	Electrical Work Nu:	5,52,279.41	
	Grand Total Nu:	54,37,823.42	

(Nu: Five Million Four Hundred Thirty Seven Thousand Eight Hundred Twenty Three and Ch. Forty Two)Only

Prepared by:



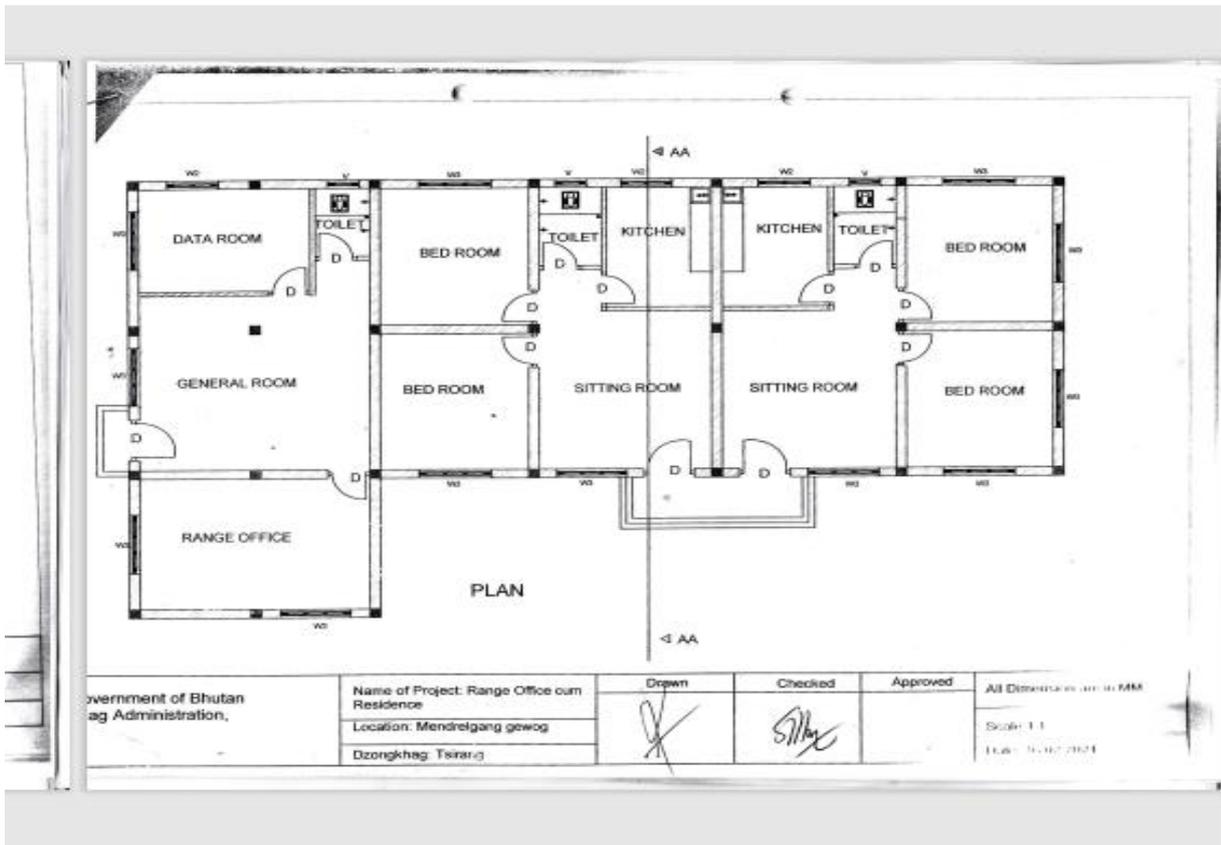
(Kencho Tshering)
Assistant Engineer

Checked By:

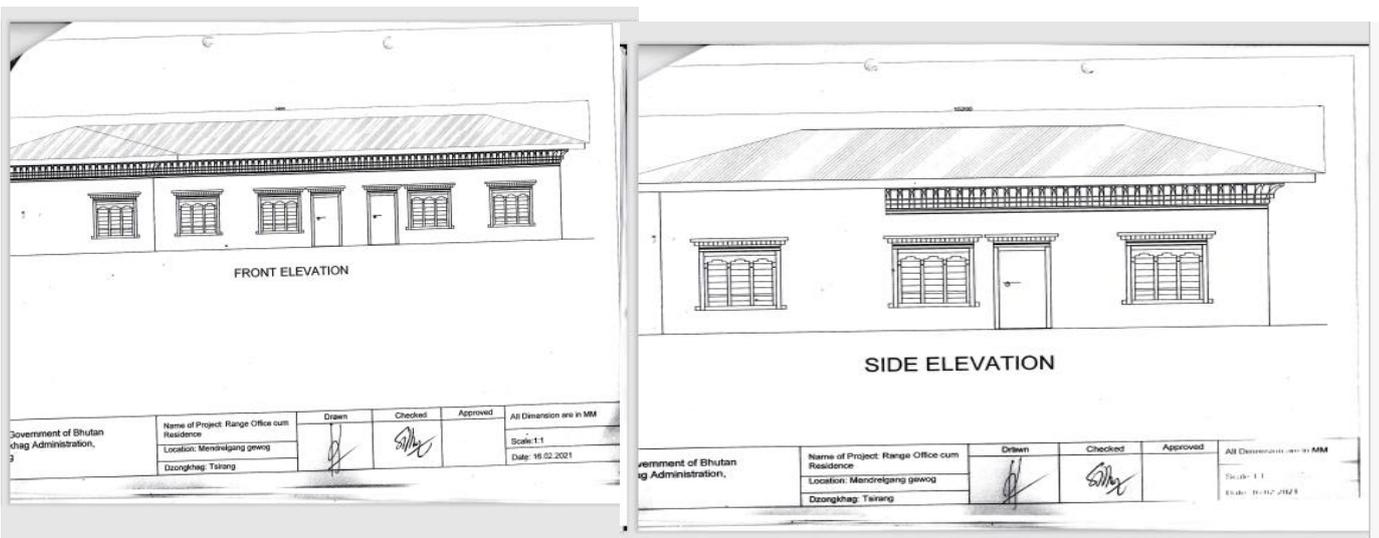


Chief Dzongkhag Engineer

Annexure 4a: Construction Layout and Plan



Annexure 4b: Front elevation and side elevation



Annexure-5

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)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 climatic conditions, 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. 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 within and around the construction sites.
- 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.
- Facilities shall be equipped 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.

¹

<https://www.ifc.org/wps/wcm/connect/1d19c1ab-3ef8-42d4-bd6b-cb79648af3fe/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES&CVID=Is62x8I>.

- 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.
- Fire exits should be identified and marked in Dzongkha and English- all workers should be made aware of the fire exits.

Lavatories and Showers

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

Potable Water Supply

- Adequate supplies of clean 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

- Workplace should receive adequate natural light and if required supplemented with artificial illumination to promote worker's safety and enable safe equipment operation.
- Emergency lighting of adequate intensity should be provided in case of failure of the powerline.

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 need to be provided where ever necessary, if there is risk of falling of overhead object.
- 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.
- Each first aid box or a cupboard shall be distinctly marked "FIRST AID"

Air Supply

- Workplace should have adequate ventilation for fresh air

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

2. 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.
3. 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 90 dB(A) for a duration of more than 8 hours per day without wearing ear plugs/ear muffs.
- Exposures to impulsive or impact noise shall not exceed 140dB(A).
- For every 3 dB(A) increase in sound levels from the permissible limit of noise, the ‘allowed’ exposure period or duration should be reduced by 50 percent.
- Where it is not practicable to reduce the noise, the employer must limit the duration of time persons employed or working in the workplace are exposed to the noise so that such persons are not exposed to excessive noise.
- 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

In any workplace where persons are at work in any process or operation which involves exposure to vibration which may constitute a risk to their health, it shall be the duty of the employer to provide, so far as is reasonably practicable, effective means to reduce the vibration.

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
- Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work
- Every person who is working on an electric supply line or apparatus or both shall be provided with tools and devices such as gloves, rubber shoes, and safety belts, ladders, earthing devices, helmets, line testers, hand lines whichever is relevant for protecting him/her from mechanical and electrical injury.

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.

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.

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.

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:

- 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 (adult man- 50kg, adult female-25kg)
- 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 if the accommodation is reasonably far from the worksite.
- The living facilities are built using adequate materials, kept in good repair and kept clean and free from waste and 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 and is regularly monitored.
- 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

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 waste collection are provided and emptied on a regular basis.

6. Rooms/dormitories facilities

- Rooms/dormitories are kept in good condition. They 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.
- Separate sleeping areas are provided for men and women.
- A separate bed is provided for every worker and use of double deck bunks is minimized.

² 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_accomodation.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-60593977-91c6-4140-84d3-737d0e203475-jqetNIh

- Workers are provided with comfortable mattresses. Workers may be expected to use their own pillows and bed linens.
- 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 and shower 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.

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.

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