

Table-1: Pre-Construction Phase Environmental Management Plan

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
1	Lack of sufficient planning to assure long term sustainability of the improvements and ensure protection of the assets created.	The MCC Design has included provisions for ensuring effective maintenance and protection of the assets to be created so as to ensure the long term sustainability. The long term sustainability has been ensured by taking into consideration appropriate Bureau of Indian Standards Codes (BIS) for MCC building design, Seismic Zone V coefficient, appropriate wind load factor (corresponding to 39 m/s wind speed), and detailed design after carrying geotechnical investigations and topographic surveys.	Verification of site specific design parameters	PWD	PMU and PMC	Review after completion of DPR	Part of PWD and PMU
2	Layout of components to avoid impacts on the aesthetics of the MCC site and surroundings	The site and layout of MCC have been finalized at vacant land close to rural habitation. The exterior of MCC building will well mix with the existing buildings.	MCC building's exteriors	PIU and PWD	PMU and PMC	Review after completion of detailed design	Part of PWD and PMU
3	Slope stability related issues	The MCC site is undulating, however, during construction any exposed slopes at excavated areas will be	Slope protection measures on side slopes of access path,	PIU and PWD	PMU and PMC	Review of recommended slope protection measures	Part of PWD and PMU

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		covered and slope protection measures will be provided specially at necessary locations in the plot.	internal roads, locations identified in the design, etc.				
4	Increased storm water runoff from alterations of the site's natural drainage patterns due to landscaping, excavation works, construction of parking lot, and addition of paved surfaces	Design of proposed MCC building enables efficient drainage of the plot. The drainage of MCC building has been integrated with existing drainage pattern of site. The storm water generated will be diverted to local drains through a properly constructed drainage system. Since MCC site is in undulating terrain, therefore, there is swift flow and drainage is not an issue.	Arrangement for proper diversion of storm water runoff	PIU and PWD	PMU and PMC	After mobilization of contractor at the site and during establishment of construction camps at MCC site.	Incidental to construction cost
5	Integration of energy efficiency and energy conservation programs in design of sub-project components	The detailed design for the proposed MCC at Chamba has ensured the environmental sustainability principles, including energy efficiency, resource recycling, waste minimization, etc. The design considers the following energy efficiency measures: <ul style="list-style-type: none"> • Usage of recyclable materials like wood substitutes. • Installation of BEE 	Specifications of rain water harvesting structures, electrical fixtures, details of water heating system	PIUs and PWD	PMU and PMC	During finalization of detailed design	Part of project cost

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		certified equipment <ul style="list-style-type: none"> Usage of energy efficient lighting fixtures (LED) Provision of P-V cells on roof top for solar power. 					
6	Consents, permits, clearances, no objection certificate (NOC), etc.	Obtain all necessary consents, permits, clearances, NOCs, etc. prior to start of civil works. Acknowledge in writing and provide report on compliance all obtained consents, permits, clearances, NOCs, etc.	Consents, permits, clearance and NOCs Records and communications	PIU	PMU	check consent for establishment of construction camp at MCC site, and approval from civic authorities	Project cost
7	Establishment of baseline environmental conditions prior to start of civil works	<ul style="list-style-type: none"> Conduct documentation of location of components, areas for construction zone (Camp, staging, storage, stockpiling, etc.) and surroundings (within direct impact zones). Include photos and GPS coordinates. Carry out environmental monitoring at MCC site for ambient air quality, water 	Records and Photographs, baseline environmental monitoring results	Contractor	PIU and PWD	Once prior to start of construction works	Contractor

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		quality and noise levels to establish baseline environmental monitoring for the parameters indicated in the monitoring plan.					
8	Utilities	<ul style="list-style-type: none"> The locations and operators of utilities to be impacted should be identified and documented in detailed design documents to prevent unnecessary disruption of services during the construction phase. Require contractor to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. Obtain from the PIU and/or PWD the list of affected utilities and operators; If relocations are necessary; contractor will coordinate with the providers to relocate the utility. 	<p>List and maps showing utilities to be shifted</p> <p>Contingency plan for services disruption</p>	<ul style="list-style-type: none"> PWD will prepare preliminary list and maps of utilities to be shifted During detailed design phase, contractor to (i) prepare list and operators of utilities to be shifted; (ii) contingency plan 	PIUs and PWD	Pre-Construction Phase	Contractor

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9	Social and Cultural Resources	<ul style="list-style-type: none"> Consult Archaeological Survey of India (ASI) or Himachal Pradesh State Archaeology Department to obtain an expert assessment of the archaeological potential of MCC site although no such potential is seen. Consider alternatives, if the MCC site, is found to be of medium or high risk. Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available. Develop a protocol for use by the contractor in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. 	Chance find protocol	<ul style="list-style-type: none"> PMC to consult ASI or HP State Archaeology Department PMC to develop protocol for chance finds 	PMU	Prior to start of construction activities	PMC
10	Construction Camp- Locations, Selection, Design and Layout	Sitting of the construction Camp, at the MCC site, shall be as per the guidelines below and	Construction Camp site, and locations of material storage	Contractor	PWD and PIU	At the time of construction camp establishment	Contractor

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		<p>details of layout to be approved by PWD. The potential locations for labor camp and construction camp shall be identified by the contractor and this identified site shall be visited by the environmental expert of PMU safeguards cell along with environmental expert of PWD and one having least impacts on environment will be approved by the PWD and PMU. As far as possible, construction camp and labor camp will be established at vacant space of plot or a house will be hired in the vicinity of site. Locations for storage of construction materials shall be identified at the site or at any suitable buildings close to MCC site. Sanitation facilities at construction camp shall be adequately planned.</p>	<p>areas, sanitation facilities</p>			<p>and finalization of storage areas</p>	
11	Sources of construction materials	<p>Use quarry sites and sources licensed by the GOHP.</p> <p>Verify suitability of all material sources and</p>	<p>Permits issued to quarries and sources of materials</p>	<p>Contractor</p> <p>PMC and PWD to verify sources (including permits) if</p>	<p>PMU and PIU</p>	<p>Upon submission by contractor</p>	<p>PMC and PWD as part of consultancy fee</p>

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		<p>obtain approvals from PIU.</p> <p>If additional quarries are required after construction has started, obtain written approval from PIU.</p> <p>Submit to PWD on a monthly basis documentation of sources of materials.</p>		additional is requested by contractor			
12	Access for Construction material transportation	<p>Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of MCC site.</p> <p>Schedule transport and hauling activities during non-peak hours.</p> <p>Locate entry and exit points in areas where there is low potential for traffic congestion.</p> <p>Keep the site free from all unnecessary obstructions.</p> <p>Drive vehicles in a considerate manner.</p> <p>Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation</p>	Traffic management plan	Contractor	PIU and PWD	During Delivery of construction materials	Contractor

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		activities cannot be avoided during peak hours.					
13	Occupational health and safety	<p>Comply with IFC EHS Guidelines on Occupational Health and Safety.</p> <p>Develop comprehensive site-specific health and safety (H&S) plans. The overall objective is to provide guidance to contractor on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project.</p> <p>Include in H&S plan measures such as: (i) type of hazards at MCC construction site; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents.</p>	Health and safety plan (H&S)	Contractor	PMU and PMC, PIU and PWD	During Pre construction phase	Contractor

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		Provide medical insurance coverage for workers.					
14	Stakeholder consultations	Continue information dissemination, stakeholder consultations, and involvement/participation of stakeholders during project implementation.	-Disclosure records - Consultations	PMU,PMC PIU,PWD and Contractor	PMU and PMC	<ul style="list-style-type: none"> • During updating of IEE Report • During preparation of site- and activity-specific plans as per EMP • Prior to start of construction • During construction 	PMU and Contractor

Table-2: Construction Phase Environmental Management Plan

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
1	Sanitation and drinking water facilities at construction Camp	The contractor shall provide sanitation facilities at the camp site. These facilities will include dust bins in adequate numbers for solid waste collection, drinking water facilities, and separate toilets for male and females. These toilets facilities shall be	Construction camp sanitation and drinking water facilities	Contractor	PWD and PIU	Regularly during construction phase	Contractor

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		maintained and septic tanks/soak pits shall be provided at the toilets. The dust bins shall be regularly emptied and waste from camp site shall be disposed off at designated locations.					
2	Traffic Circulation plan during construction phase	Prior to commencement of site activities and mobilization on ground ,the Contractor will prepare and get approved from the Engineer (PWD),circulation plan during construction for safe passage of public vehicles so that locals are not at inconvenience. The Contractor with support of the PIU will carry out dissemination of these information and circulation plan at MCC Chamba site and main access roads	Safe movement of Traffic	Contractor	PWD and PIU	Every day during construction phase	Contractor
3	Site clearance activities, including delineation of construction areas	Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from the Environmental Experts of PWD and PMC. All areas used for temporary construction	Pre-construction records of site and vegetation in area of construction	Contractor	PWD and PIU	Duration of site preparation	PWD and PIU

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
		operations will be subjected to complete restoration to their former conditions with appropriate rehabilitation procedures. The photographic records shall be maintained for the temporary sites used for construction. These will help in proper restoration.					
4	Drinking water availability at Construction camp and construction sites	Sufficient supply of potable water to be provided and maintained. If the drinking water is obtained from an intermittent public water supply then storage tanks will be provided. For this contractor will submit plans how availability of drinking water shall be assured. In case it is obtained from the natural spring then permission from local authorities shall be obtained.	Water supply source and availability of water , permission of local authority if obtained from local spring	Contractor	PWD and PIU	During Construction phase regularly	Contractor
5	Waste disposal	The pre-identified disposal location shall be part of Comprehensive Waste Disposal Plan. Solid Waste Management Plan to be prepared by the Contractor in consultation with local civic authorities. The Environmental	Waste Disposal sites, waste management plan	Contractor	PWD and PIU	Regularly during construction phase	Contractor

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		Specialist of PWD shall approve these disposal sites after conducting a joint inspection on the site with the Contractor. Contractor shall ensure that waste shall not be disposed off near natural streams in the surroundings of site and along the access path.					
6	Stockpiling of construction materials	Stockpiling of construction materials will be done in such a way that it does not impact and obstructs the drainage. The stockpiles will be covered to protect from dust and erosion.	Stockpiling sites at MCC site	Contractor	PWD and PIU	Regularly during construction phase	Contractor
7	Arrangement for Construction Water	(i) The Contractor shall provide a list of locations and type of sources from where water for construction shall be acquired. (ii)The contractor shall use ground/surface water as a source of water for the construction with the written consent from the concerned Department. (iii)To avoid disruption/disturbance to other water users, the Contractor shall arrange water from market or from local municipality	Water availability at identified water source locations	Contractor	PWD and PIU	Regularly during construction phase	Contractor

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		and consult PWD before finalizing the source.					
8	Soil Erosion	Slope protection measures will be undertaken as per design to control soil erosion especially on side slopes of access and internal roads.	Locations of slope protection	Contractor	PIU and PWD		Contractor
9	Water Pollution from Construction Wastes	<ul style="list-style-type: none"> The Contractor shall take all precautionary measures to prevent entering of wastewater into any local stream during construction. The water quality of ground and surface water will be taken up as per monitoring plan. 	Sub-project site	Contractor	PIU and PWD	Regularly during construction phase	Contractor
10	Water Pollution from Fuel and Lubricants	<ul style="list-style-type: none"> The Contractor shall ensure that all construction vehicle parking locations, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling site shall be located at least 500 m away from the natural streams. Contractor shall ensure that all vehicle/machinery and equipment operation, maintenance and 	Vehicle parking, refueling sites, Oil interceptor functioning	Contractor	PIU and PWD	Regularly during construction phase	Contractor

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		refueling shall be carried out in such a manner that spillage of fuels and lubricants does not contaminate the ground. <ul style="list-style-type: none"> Waste water from vehicle parking, fuel storage areas, workshops, wash down and refueling areas shall be treated in an oil interceptor before discharging it on land or into surface water bodies or into other treatment system. The water quality monitoring of ground water will be taken up as per monitoring plan. 					
11	Soil Pollution due to fuel and lubricants, construction wastes	The fuel storage and vehicle cleaning area will be stationed such that spillage of fuels and lubricants does not contaminate the ground.	Vehicle maintenance and parking area, soil quality monitoring results	Contractor	PIU and PWD	Regularly during construction phase	Contractor
12	Siltation of water bodies due to spillage of construction wastes	No disposal of construction wastes will be carried out into the surface water bodies. Extraneous construction wastes will be transported to the pre-identified disposal sites for safe disposal.	Water bodies specially natural streams	Contractor	PIU and PWD	Regularly during construction phase	Contractor

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13	Generation of dust	The contractor will take every precaution to reduce the levels of dust at construction site. All the cut material to be protected/ covered in a manner to minimize dust generation. In order to minimize impacts on neighboring sites, the MCC site will be properly barricaded with prefabricated MS sheets of adequate height (3-4 m).	Sub-project site, air quality monitoring results	Contractor	PIU and PWD	Regularly during construction phase	Contractor
14	Emission from Construction Vehicles, Equipment and Machinery	All vehicles, equipment and machinery used for construction shall conform to the relevant Bureau of India Standard (BIS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 shall be strictly adhered to. The silent/quiet equipment available in the market shall be used in the MCC construction. The Contractor shall maintain a record of PUC for all vehicles and machinery used during the contract period which shall be produced for	PUC certificates of vehicles and machinery	Contractor	PIU and PWD	Regularly during construction phase	Contractor

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		verification whenever required.					
15	Noise Pollution	<p>The Contractor shall confirm that all Construction equipment used in construction shall strictly conform to the MoEFCC and CPCB noise standards and all vehicles and equipment used in construction shall be fitted with exhaust silencers.</p> <p>At the construction sites noisy construction work such as crushing, operation of DG sets, use of high noise generation equipment shall be stopped during the night time between 10.00 pm to 6.00 am.</p> <p>Noise limits for construction equipment used in this project will not exceed 75 dB (A). The MCC site will be properly barricaded with MS Sheets of adequate height to avoid impacts of noise generated due to construction activities.</p>	Certificates of vehicles conforming noise standards, noise monitoring results	Contractor	PWD and PIU	Regularly during construction phase	Contractor
16	Impacts on flora and fauna	Minimize impacts on flora and fauna during construction phase by limiting site clearance bare	Environmental monitoring reports, Trees and	Contractor	PWD and PIU	Regularly during construction phase	Contractor

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		minimum and limiting all types of pollution generation	shrubs planted at MCC site				
17	Material Handling at Sub-Project site	<p>Workers employed on mixing cement, lime mortars, concrete, etc., will be provided with protective footwear and protective goggles. Workers, who are engaged in welding works, will be provided with welder's protective eye-shields.</p> <p>The use of any toxic chemical will be strictly in accordance with the manufacturer's instructions. The PWD will be given at least 6 working days' notice of the proposed use of any chemical. A register of all toxic chemicals delivered to the site will be kept and maintained up to date by the Contractor.</p>	Data on available personal protective equipment	Contractor	PWD and PIU	Regularly during construction phase	Contractor
18	Disposal of Construction Waste, and Debris	The Contractor shall confirm that safe disposal of the construction waste will be ensured in the pre-identified disposal locations. In no case, any	Disposal site	Contractor	PIU and PWD	Regularly during construction phase	Contractor

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		construction waste will be disposed off in open area near MCC site					
19	Onsite emergency plan for minor accidents and mishaps and Disaster Management Plan for Natural Calamities	The onsite emergency plan will be prepared by the contractor in consultation with PWD and PMC. For natural calamities, disaster management plan prepared by the PWD under the provisions of Disaster Management Act 2005 will be followed.	Onsite emergency plan document and Disaster Management Plan document of PWD	Contractor	PWD	Mock Drill every quarter	Contractor
20	Safety Measures During Construction	Adequate safety measures for workers during handling of materials at the proposed MCC site will be taken up. The contractor has to comply with all regulations for the safety of workers. Precaution will be taken to prevent danger of the workers from accidental injuries, fire, etc. First aid treatment will be made available for all injuries likely to be sustained during the course of work. The contractor will conform to all anti-malaria instructions given to him by the Engineer.	Records of availability of personal protective equipment, availability of first aid kits	Contractor	PIU and PWD	Regularly during construction phase	Contractor
21	Clearing of	Contractor to prepare site	Restoration	Contractor	PIU and	End of	Contractor

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	Construction of Camp and Restoration	restoration plans for approval by the Engineer (PWD). The plan is to be implemented by the contractor prior to demobilization. On completion of the works, all temporary structures will be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the PWD	plan, and records of pre-construction of temporary sites		PWD	construction phase	

Table-3: Operation Phase Environmental Management Plan

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measure
1	Environmental Conditions	The periodic monitoring of the ambient air quality, noise levels, and water quality will be taken up as per monitoring plan through an approved monitoring agency. Necessary boundary wall and plantation around boundary will be maintained to screen vehicular traffic emissions from access road.	Monitoring results and relevant standards	Contractor (during defect liability period) and DOLE (in second year of operation) through Pollution Monitoring Agency	PMU	As per monitoring Plan	DOLE, Contractor and PMU
2	Unhygienic conditions due to poor maintenance of sanitation facilities and irregular solid waste collection	The DOLE will carry out maintenance of the toilets at MCC and carry out the regular collection and disposal of wastes to a designated waste treatment site. The solid waste disposal will be integrated with the Chamba town waste disposal system. Septic tanks will be maintained and regularly emptied.	Maintenance schedule of MCC building and facilities created	DOLE	PMU	Every Quarter	DOLE and PMU
3	Natural Disasters	Necessary procedures to be followed by the visitors, MCC staff and trainees during the natural disasters shall be written at prominent locations.	Warnings of disasters by Meteorological Department	District Administration	DOLE	During Disasters	Government of Himachal Pradesh
4	Waste from operation and maintenance of solar PV Cell	The supplier of Solar PV cell will collect any waste generated on account of operation and maintenance for	Waste generated from operation and	Supplier and Operator of Solar PV Cell	MCC Chamba Manager	As per schedule of maintenance	Fee of Solar PV Cell Supplier

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		possible recycle/reuse/disposal as operations will be maintained by the supplier.	maintenance of Solar PV Cell				
5	Onsite emergency plan for minor accidents and mishaps and Disaster Management Plan for Natural Calamities	The MCC Chamba Manager will prepare onsite emergency plan for possible minor accidents and mishaps for operational phase. For natural calamities, the disaster management plan prepared by DOLE will be followed.	Onsite Emergency plan document and Disaster Management Plan document	Manager MCC Chamba	DOUD	Mock Drills every quarter	MCC operation cost