SFG3957 V3

JHARKHAND MUNICIPAL DEVELOPMENT PROJECT (JMDP)

-DRAFT-

ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT

STORM WATER DRAINAGE, DHANBAD

VOLUME II- ANNEXURES

Jharkhand Urban Infrastructure Development Company Limited
(JUIDCO)

December 2017

ANNEXURE I: ENVIRONMENT AND SOCIAL SCREENING FORMAT

DRAFT
03/03/17

Jharkhand Municipal Development Project
Environmental and Social Screening Format

Part A

Name of the Department: JUIDCO LTD.

Name of the City/Municipality: Dhanbad

Names&Designation of the Officers responsible:

1	JUIDCo	Environment Specialist Social Specialist
2	ULB	City Engineer City Manager
3	Consultant	TATA CONSULTING ENGINEERS LTD.

Name of the proposed sub project:	**Preparation of Detail Project Report and Project Management Consultancy to execute Integrated Sewerage System and Storm Water Drainage System across various towns of Jharkhand (Package 1&2)**
Name of the proposed site:	Dhanbad Municipal Cooperation
Proposed sub component/functions at the site: e.g. Intake point/STP/WTP/Rising main/Distribution main/distribution line etc.	Storm Water Drainage System
Current land use of the proposed site:	No land requirement

Part B

(Please tick mark ✓in the appropriate column and provide relevant information)

Sl. No	Social Screening Questions	Probable social Impacts		
		Yes	No	Comments/Remarks
1	Is land in the possession of Municipality? What is the area?		No	No land required for this component
2	Is the current ownership status of the proposed site clear? Who is the current owner?	Yes		All drains are under ownership of Municipality
3	Is there any land transfer formalities to be completed before using the site for proposed function?		No	No land required for this component

Sl. No	Social Screening Questions	Probable social Impacts		
		Yes	No	Comments/Remarks
4	Will there be loss perennial crops (yielding and/or fruit bearing and other trees?		No	
5	Will the project displace residential structures (Houses)?		No	Drains will be designed on existing ROW of road.
6	Will the project displace commercial structures (shops workshops, factory and other establishments)?	yes		The displacement of hawkers and footpath shops is on temporary basis as the provision is kept in the DPR to provide slabs over drain for subsequent usage.
7	Will there be loss of structures other than buildings? (Compound wall/gate/water tanks/ slabs/ wells/ septic tanks, etc.		No	Drains will be designed on existing ROW of road.
8	Are any cultural properties (place of worship, religious structure, memorial, monument, cemetery, etc.) affected or displaced?		No	Drains will be designed on existing ROW of road.
9	Are any community properties (hand pump, well, tap, chabutra, community hall etc.) affected or displaced?		No	Drains will be designed on existing ROW of road.
10	Are any tenants running enterprises or operating from the structures that would be displaced?		No	Such condition doesn't exist.
11	Are there any tenants residing in the structures that would be displaced?		No	Drains will be designed on existing ROW of road.
12	Are there residential quatters within the proposed site boundary?		No	Drains will be designed on existing ROW of road.
13	Are there commercial squatters/vendors/Hawkers within the proposed site boundary?	Yes		Hawkers are present on the footpath/ ROW of road with temporary business arrangements.
14	Will there be loss of incomes and livelihoods of employees of affected establishments/ structures?		No	Precast slabs are provided for the hawkers to maintain their business.
15	Will people lose access to common facilities, services, or natural resources?		No	Drains will be designed on existing ROW of road.
16	Will there be loss of existing access to private properties and services?		No	Temporary arrangements will be done during construction

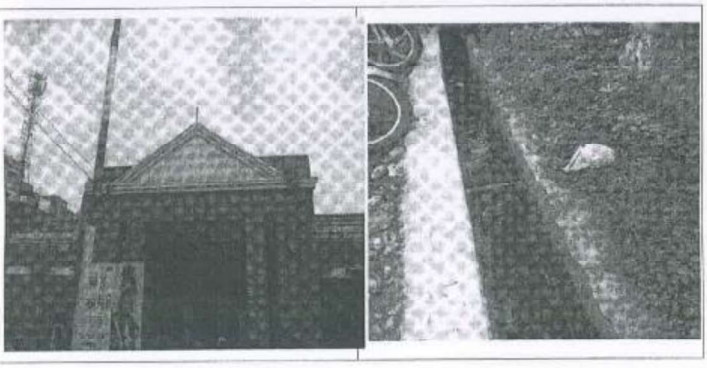
Sl. No	Social Screening Questions	Probable social Impacts		
		Yes	No	Comments/Remarks
				and implementation.
17	Is there any Tribal community members residing in group/cluster in close proximity to the site?		No	Drains will be designed on existing ROW of road.
18	Is there possibility of any conflict/Grievances by the surrounding land users due to proposed activities on the site?		No	No land required for this component

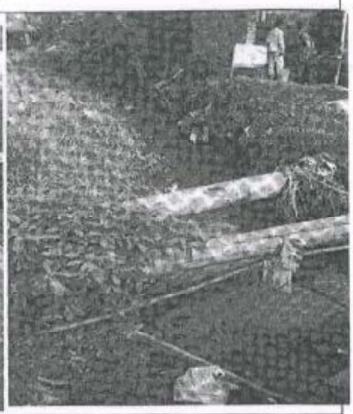
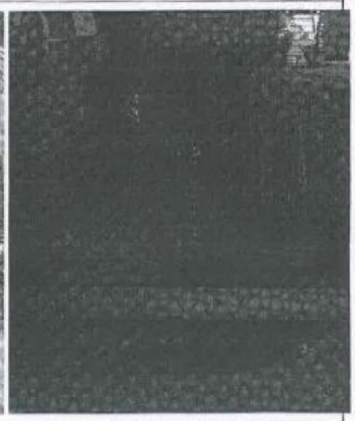
Sl. No	Environmental Aspect	Possible Impacts			
		Yes	No	Possible	Comments/Remarks
19	Is the sub project in an eco-sensitive area or adjoining an eco-sensitive area? If Yes, which is the area? Elaborate accordingly.		No		The project has no harm to agricultural land or wildlife. Hence the Environmental Impact is negligible.
20	Are there any cultural heritage sites; known heritage sites in the project area, or broader area of influence?		No		No cultural resources are associated with the city
21	Are there any sensitive human receptors within close proximity of the site? E.g. school or hospital		No		Drains will be designed on existing ROW of road.
22	Will the project involve significant removal of vegetative cover/tree cutting?		No		Drains will be designed on existing ROW of road.
23	Will the activities proposed at the site impact water quality and water resource availability and use?	~~Yes~~	No		During operation stage, the drains will be covered properly. There is no probability of degradation of water quality during operations of the project. During Construction Stage, the contractor shall take all precautionary measures as per EMP such as collection and proper disposal off construction wastes/debris, storage of all hazardous wastes

Sl. No	Environmental Aspect	Possible Impacts			
		Yes	No	Possible	Comments/Remarks
					appropriately and approved in bunded areas away from water courses for safe transport off-site for reuse, provision of waste water tanker and temporary arrangement for diversion of storm water from existing drain for disposal of waste water. Proper Sanitation and Sewerage system would be implemented.
24	Does the project have the potential to pollute the environment, or contravene any environmental laws and regulations?		No		All design and Implementations are to be done by following the Environmental laws and guidelines provided by Govt. of India. All safety measures are taken into accountability.
25	Will the project cause increased disruption to traffic movements and/or possible conflicts with and/or disruption to local community within the urban area?			Possible	Before start the construction, proper traffic management plan will be prepared and submitted to Project Implementation Unit for approval. Necessary signage and barricading will be provided for safety of users. Traffic along the construction route would be temporarily stopped and other surrounding routes for diverting same would be determined.
26	Will the project require prior environmental clearance either from the MoEF or from a relevant State Government Department E.g. SPCB for establishment of STP/ State		No		The sub project does not fall in the purview of EIA Notification 2006 & subsequent amendment.

Sl. No	Environmental Aspect	Possible Impacts			
		Yes	No	Possible	Comments/Remarks
	Forest Department for either the conversion of forest land or for tree-cutting.				Therefore, environmental clearance is not required. However, necessary permissions/ consents if any will be required then it has to be obtained by the contractor. (Is batching plant required to be installed for this project so as to get quality concrete output, then only for this necessary permissions/ consents will be required for installation of HMP/Batch Mix Plant, crusher and quarry by the contractor).

Please attach photographs and location maps along with this completed Environmental & Social Information Format for Screening. This Screening sheet must be completed for each of the proposed sites by respective cities/towns.



Nagar Parishad Office, Dhanbad	Small drain in Dhanbad
	
Drain in Dhanbad	Transport Nagar Drain in Dhanbad
	
Clogged Drain in Dhanbad	Drain adjacent to Skylark hotel

	
Drain in Dhanbad	Small Drains

Date

Signature and Name of the Officer Responsible

ANNEXURE II: APPLICABLE ENVIRONMENTAL STANDARDS

Applicable Standards – CPCB

Drinking Water Standard

Drinking water guideline as per IS 10500, 2012 has been presented in Table 1.

Table 1: Drinking Water Standard

S.No	Characteristic	Acceptable Limit	Permissible Limit
General Parameters			
1	Colour, Hazen units, *Max*	5	15
2	Odour	Agreeable	Agreeable
3	*p*H value	6.5-8.5	No Relaxation
4	Turbidity, NTU, *Max*	1	5
5	Total dissolved solids, mg/l	500	2000
6	Aluminium (as Al), mg/l, *Max*	0.03	0.2
7	Ammonia (as total ammonia-N)mg/l, *Max*	0.5	No relaxation
8	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0
9	Barium (as Ba), mg/l, *Max*	0.7	No relaxation
10	Boron (as B), mg/l, *Max*	0.5	1
11	Calcium (as Ca), mg/l, *Max*	75	200
12	Chloramines (as Cl2), mg/l, *Max*	4	No relaxation
13	Chloride (as Cl), mg/l, *Max*	250	1000
14	Copper (as Cu), mg/l, *Max*	0.5	1.5
15	Fluoride (as F) mg/l, *Max*	1.0	1.5
16	Free residual chlorine, mg/l, *Min*	0.2	1
17	Iron (as Fe), mg/l, *Max*	0.3	No relaxation
18	Magnesium (as Mg), mg/l, *Max*	30	100
19	Manganese (as Mn), mg/l, *Max*	0.1	0.3
20	Mineral oil, mg/l, *Max*	0.5	No relaxation
21	Nitrate (as NO3), mg/l, *Max*	45	No relaxation
22	Phenolic compounds (as C6H5OH), mg/l, *Max*	0.001	0.002
23	Selenium (as Se), mg/l, *Max*	0.01	No relaxation
24	Silver (as Ag), mg/l, *Max*	0.1	No relaxation
25	Sulphate (as SO4) mg/l, *Max*	200	400
26	Sulphide (as H2S), mg/l, *Max*	0.05	No relaxation
27	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600
28	Total hardness (as CaCO3), mg/l, *Max*	200	600
29	Zinc (as Zn), mg/l, *Max*	5	15
Concerning Toxic Substances			
30	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation
31	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation
32	Lead (as Pb), mg/l, *Max*	0.01	No relaxation
33	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation
34	Molybdenum (as Mo), mg/l, *Max*	0.07	
35	Nickel (as Ni), mg/l, *Max*	0.02	

S.No	Characteristic	Acceptable Limit	Permissible Limit
36	Polychlorinated biphenyls, mg/l, * — *Max*	0.0005	No relaxation
37	Polynuclear aromatic hydro carbons (as PAH), mg/l, *Max*	- 0.000 1	No relaxation
38	Total arsenic (as As), mg/l, *Max*	0.01	0.05
39	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation
40	Bromoform, mg/l, *Max*	0.1	No relaxation
41	Dibromochloromethane, — mg/l, *Max*	0.1	No relaxation
42	Bromodichloromethane, — mg/l, *Max*	0.06	No relaxation
43	Chloroform, mg/l, *Max*	0.2	No relaxation
Concerning Radioactive Substances			
44	Alpha emitters Bq/l, *Max*	0.1	No relaxation
45	Beta emitters Bq/l, *Max*	1.0	No relaxation
Bacteriological Quality of Drinking Water1)			
46	*All water intended for drinking*: a) *E. coli* or thermotolerant coliform bacteria2),	Shall not be detectable in any 100 ml sample	
47	*Treated water entering the distribution system*: a) *E. coli* or thermotolerant coliform bacteria2) Shall not be detectable in any 100 ml sample b) Total coliform bacteria		
48	*Treated water in the distribution system*: a) *E. coli* or thermotolerant coliform bacteria Shall not be detectable in any 100 ml sample b) Total coliform bacteria		

Surface Water

Surface Water Quality criteria as per CPCB guidelines has been presented in Table 2.

Table 2: Primary Water Quality Criteria for Designated-Best-Use-Classes

Designated-Best-Use	Class	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	▶ Total Coliforms Organism MPN/100ml shall be 50 or less ▶ pH between 6.5 and 8.5 ▶ Dissolved Oxygen 6mg/l or more ▶ Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organized)	B	▶ Total Coliforms Organism MPN/100ml shall be 500 or less ▶ pH between 6.5 and 8.5 ▶ Dissolved Oxygen 5mg/l or more ▶ Biochemical Oxygen Demand 5 days 20°C 3mg/l or less

Designated-Best-Use	Class	Criteria
Drinking water source after conventional treatment and disinfection	C	▶ Total Coliforms Organism MPN/100ml shall be 5000 or less ▶ pH between 6 to 9 ▶ Dissolved Oxygen 4mg/l or more ▶ Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wildlife and Fisheries	D	▶ pH between 6.5 to 8.5 ▶ Dissolved Oxygen 4mg/l or more ▶ Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial cooling, Controlled waste disposal	E	▶ pH between 6.0 to 8.5 ▶ Electrical Conductivity at 25°C micro mhos/cm Max.2250 ▶ Sodium absorption Ratio Max. 26 ▶ Boron Max. 2mg/l
	Below-E	▶ Not Meeting A, B, C, D & E Criteria

Source: Central Pollution Control Board

DG Set Emission Standards

Emission limits for new diesel engine up to 800 kW for generator set (Gen-set) application has been presented in Table 3.

Table 3: Emission limits for new diesel engine up to 800 kW

Power Category	Emission Limits (g/kW-hr)			Smoke Limit (light absorption coefficient, m-1)
	NOx +HC	CO	PM	
Upto 19 KW	≤ 7.5	≤ 3.5	≤ 0.3	≤ 0.7
More than 19 KW upto 75 KW	≤ 4.7	≤ 3.5	≤ 0.3	≤ 0.7
More than 75 KW upto 800 KW	≤ 4.0	≤ 3.5	≤ 0.2	≤ 0.7

Environmental Quality Standards – IFC EHS Guidelines

Noise Levels

The ambient noise quality standard as prescribed by CPCB in the Noise Rules 2000 has been provided in Table 4.

Table 4: Ambient Noise Quality Standard

Area Code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence Zone	50	40

Air Quality

The ambient air quality guideline as provided in World Bank Group's General EHS Guidelines 2007 has been presented in Table 5.

Table 5: Ambient Air Quality Guideline

Parameter	Averaging Period	Guideline value in µg/m³
Sulfur dioxide (SO2)	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute	500 (guideline
Nitrogen dioxide (NO2)	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM10	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM2.5	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Wastewater

Sanitary wastewater from facilities may include effluents from domestic sewage, food service, and laundry facilities serving site employees. Miscellaneous wastewater from laboratories, medical infirmaries, water softening etc. may also be discharged to the sanitary wastewater treatment system. World Bank Group's General EHS Guidelines 2007 for sanitary wastewater quality has been presented in Table 6.

Table 6: Sanitary Waste Water Discharge Guideline

Pollutants	Pollutants	Guideline Value
pH	pH	6-9
BOD	mg/l	30
COD	mg/l	125
Total nitrogen	mg/l	10
Total phosphorus	mg/l	2
Oil and grease	mg/l	10
Total suspended solids	Mg/l	50
Total coliform bacteria	MPN / 100 ml	400

Noise Level Guideline

As per World Bank Group's General EHS Guidelines 2007, noise impacts should not exceed the levels presented in Table 7 or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

Table 7: Noise Guideline

Receptor	One Hour LAeq (dBA)	
	Daytime 07:00 - 22:00	Night-time 22:00 - 07:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

ANNEXURE III: GUIDELINES FOR TOP SOIL MANAGEMENT

Loss of topsoil is a long-term impact due to the following reasons: (i) site clearance (ii) temporary construction activities such as construction camps, material storage locations, diversion routes etc. The environmental measures for both these activities during all stages of construction activity are discussed in the subsequent sections.

The top soil from all sites shall be stripped to a specified depth of 15 cm and stored in stock piles for reuse. A portion of temporarily acquired area and/or RoW edges will be earmarked for storing top soil. The locations for stacking will be pre-identified in consultation and with approval of JUIDCO. The following precautionary measures will be taken by the Contractor to preserve the stock piles till they are re-used:

- Stockpiles will be such that the slope doesn't exceed 1:2 (vertical to horizontal), and height is restricted to 2 m
- To retain soil and allow percolation of water, the edges of pile will be protected by silt fencing
- Multiple handling kept to a minimum to ensure that no compaction occurs ·
- Stockpiles shall be covered with empty gunny bags or will be planted with grasses to prevent the loss during rains
- Such stockpiled topsoil will be utilized for:
    - Covering reclamation sites or other disturbed areas
    - Top dressing and raising turfs
    - Filling up of tree pits
    - For developing compensatory plantation ·
    - In the agricultural fields of farmers, acquired temporarily that needs to be restored
    - Residual top soil, if there is any, shall be utilized for the plantations works The utilization as far as possible shall be in the same area from where top soil was removed. The stripping, preservation and reuse shall be carefully inspected, closely supervised and properly recorded by JUIDCO

ANNEXURE IV: LABOUR CAMP SITE MANAGEMENT PLAN

INTRODUCTION

The scope of this plan pertains to the siting, development, management and restoration of construction and labour camps to avoid or mitigate impacts on the environment. According to estimates, during the peak construction time the total no of skilled and unskilled labours is estimated to be 350 nos. However most of the labour shall be locally hired by contractor from Dhanbad and nearby villages/area. Approximately 85-90% of labours will be locally hired. It is expected that only 10-15% (55 nos.) of skilled labours and unskilled labours may come from outside the Dhanbad city. The Labour camp shall be setup for 55 nos. of labour and will be approximately 1 acre. JUIDCo is working with the ULB to identify suitable sites for the workers camps, the final decision lies with the contractor but any selected site would have to be approved by JUIDCo and ULB.

Guidelines for setting up of labour camp have been provided in Annexure IV. However, these numbers are only indicative given the context of labour requirements in Jharkhand. The contactor, once on board would require to set up construction and labour camp for keeping the health and safety of workers and impacts of setting up such camps on the local community in consideration according to the specifications in this plan. This plan is prepared in reference to the guidance provided in the ESMF on Labour camp siting and management, and the Workers accommodation: processes and standards (A guidance note by IFC and EBRD).

Most impacts arising from operation of the camps would be managed by the contractor as they concern his staff. Responsibilities for managing these impacts have been clearly reflected as a contractual obligation, with appropriate mechanisms for addressing non-compliance. Although the worker's accommodation and camp site would cover a relatively small area of 1 acre, some impacts associated could include generation of waste/ litter, water demands, fuel wood collection, soil erosion, and spillage of oils and fuel; f improperly managed can contaminate local environmental resources (soil, water) and pose public health risks. These associated impacts/ risks would need to be managed appropriately in accordance with the provisions of this plan.

The contractor would also be required to develop specific labour management procedures and mitigation measures before the start of works and monitor and update the labour management plan as necessary during the project. JUIDCO would develop a separate training module with the help of technical partner to build the capacity of JUIDCO,

Supervision Consultants and Contractors in preparation and execution of this labour management plan. This would address specific activities that will be undertaken to minimize the impact on the local community, including elements such as

i. Communication and awareness plan on national labour and women harassment laws and its penal implications, leave provisions and other allowances for workers benefit,
ii. Worker codes of conduct with respect to manual scavenging, engagement with residents, child labour, non-discrimination, harassment of co-workers including women and those belonging to SC and STs and other minority social groups.
iii. Training programs on HIV/AIDS and other communicable diseases, etc.
iv. Compliant handling Mechanism at the sub project level

Pre-Construction Stage

Siting: During the construction stage of the project, the construction contractor will construct and maintain necessary living accommodation, rest areas and ancillary facilities for labour such that the requirements of food, healthcare, merchandise, transport, and recreation can be ensured. Contractor shall follow all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp. The labour camp will be set up on an area of _approximately 2 acres per package/contract. The camp site and has been determined keeping in mind the site would not be located within or close to environmentally sensitive areas. The camp site and its associated facilities such as access roads do not involve forest clearance and do not negatively affect local wildlife.
The Supervisor of the camp should take the attendance of the employee at each camp twice in a day (morning and evening) and should maintain the record. Further work hours of the workers should be maintained in accordance to the labour law and as mentioned in the labour licence. All workers should be provided with ID card and entry to the site should be through ID card only and should be ensured by security guard.

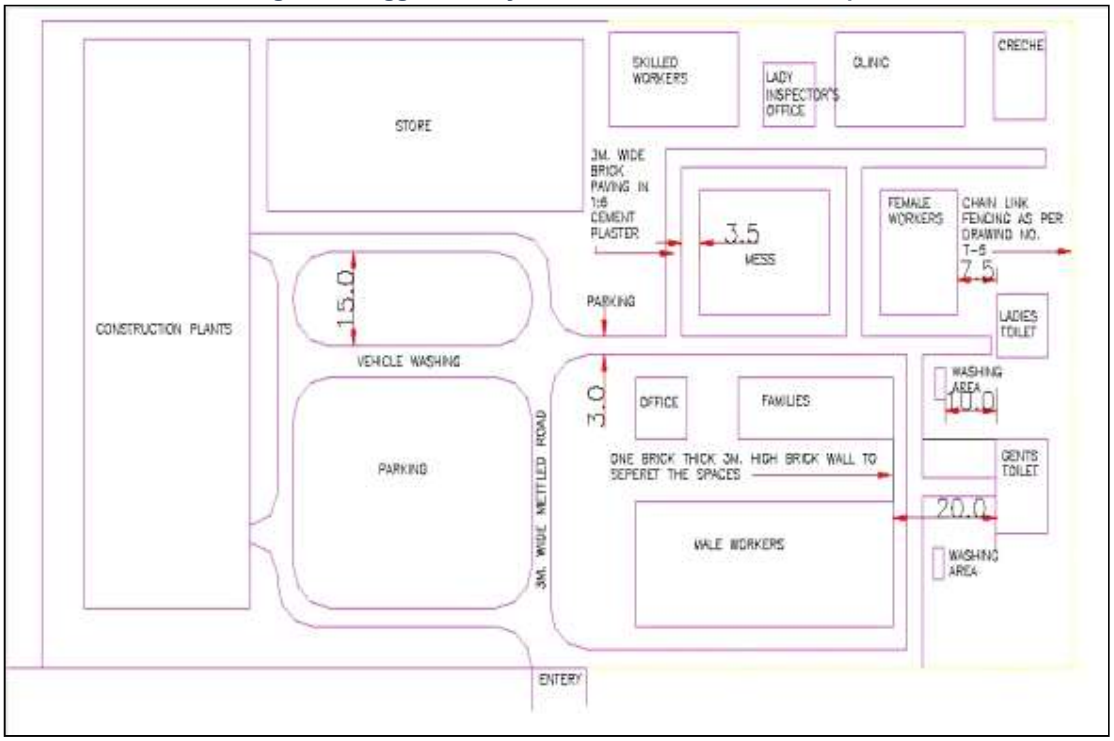
The contractor will work out arrangements for setting up his facilities during the duration of construction with the land owner/concerned department. These arrangements shall be in the form of written agreement between the contractor and the land owner (private/government) that would specify:

i. Photograph of the proposed camp site in original condition;
ii. List the activities to be carried out in the site
iii. Environmental mitigation measures to be undertaken to prevent land, air, water and noise pollution

iv. Detailed layout plan for development of the construction and labour camp that shall indicate the various structures to be constructed in the camp including temporary, drainage and other facilities (as shown in figure below) gives a generic layout plan for a construction camp); and Restoration plan of camp site to previous camp conditions

v. The arrangements will be verified by the JUIDCO PIU to enable redressal of grievances at a later stage of the project.

Figure 1: Suggestive Layout Plan for Construction Camp



1. Setting up of labour and construction camps

During the construction stage of the project, the construction contractor will construct and maintain necessary (temporary) living accommodation, rest area and ancillary facilities for labour. Contractor shall follow all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp.

The labour camps will be set up on an area of _approximately 2 acres. Supervisor of the camp should take the attendance of the employee at each camp twice in a day (morning and evening) and should maintain the record. Further work hours of the workers should be maintained in accordance to the labour law and as mentioned in the labour licence. All

workers should be provided with ID card and entry to the site should be through ID card only and should be ensured by security guard.

Living accommodation and ancillary facilities should be provided to all the migrant workers employed for the complete duration of construction/maintenance period. The rooms of labour shall be well lighted and ventilated. Transportation to the labour from the camp to the working site should also be provided, along with the facilities and provisions to be provided for the labour are described below:

a) Site barricading
b) Clean Water Facility
c) Clean kitchen area with provision of clean fuel like LPG
d) Clean Living Facilities for Workers
e) Sanitation Facilities
f) Waste Management Facilities
g) Rest and emergency area for workers at construction site
h) Safe access road is required at camps
i) Health Care Facilities
j) Crèche Facility & Play School
k) Fire-fighting Facility

1.1. Site Barricading:

Site should be completely barricaded from all the sides to prevent entry of outsiders and animals into the site with adequate marking, flags, reflectors etc. for safety of general traffic movement and pedestrians. Entry gate should be provided at the site and labour and construction camp which should be guarded by security guard. All workers should be issued ID cards and entry of outsiders shall be maintained in the register at the gate. Board should be displayed at the site and the labour camp, the name of project, capacity of project, authority carrying our projects, restriction of entry without authorization, no smoking zone and associated risks. Plant and machinery operation shall be restricted to 6:00 Am to 10:00 PM

1.2. Clean Water/ Drinking Water

Towards the provision and storage of drinking water at the construction camp, the contractor shall ensure the following provisions

i. Potable water shall be provided for construction labour for drinking & cooking purpose. Clean water shall be provided for bathing, cleaning and washing purpose. Water quality testing for drinking water provided for workers shall be carried out on monthly basis. Water dispensers should be cleaned on monthly basis. Adequate water per person should be provided at site for drinking, cooking, bathing, cleaning and other use purpose

ii. Every water supply or storage shall be at a distance of not less than 15m from any wastewater / sewage drain or other source of pollution. Water sources within 15m proximity of toilet, drain or any source of pollution will not be used as a source of drinking water in the project.

iii. If bore well used as drinking water source, it shall be covered, the door shall be kept locked and opened only for cleaning or inspection, which shall be done at least once a month. There shall be a motor installed for extraction of water from well.

iv. In every site, adequate and suitable facilities for washing clothes and utensils shall be provided and maintained for the use of contract labour employed therein. Separate and adequate bathing shall be provided for the use of male and female workers. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic conditions.

1.3. Kitchen Area:

Provision of clean kitchen area for cooking and storage of eatables shall be provided. Clean fuels like LPG shall be provided for cooking purpose. Burning of firewood, garbage, paper and any other material for cooking or any other purpose shall strictly be prohibited at the site. Separate utensil washing area should be provided with proper drainage system. Kitchen waste should be daily cleaned and disposed off. Water storage facility at kitchen should be covered and cleaned on monthly basis. Kitchen area should be away from washing, toilets and bathing area. Wall surfaces adjacent to cooking areas are made of fire-resistant materials. Food preparation tables are also equipped with a smooth durable washable surface.

1.4. Living Facility for the Workers:

Workers should be provided with proper bedding facility. Single bed should be provided to each worker and each bed should be at least 1 m apart from another. Double deck bedding should be avoided, in case provided, adequate fire-fighting facility should be provided.

Bed linen should be washed regularly and should be applied with repellent and disinfectants so as to manage the diseases caused due to pests. Use of Long Lasting Impregnated Nets

or use of Pyrethroids (in WHO class III – especially formulated for public health) for mosquito and vector control.

Facilities for storage of personal belongings for workers should be provided in form of locker, shelf or cupboard. A separate storage area for the tools, boots, PPE should be provided. Proper ventilation through mechanical systems and lighting system should be ensured in construction camps.

1.5. Sanitation and Toilet Facilities

Sanitary arrangements, latrines and urinals shall be provided in every work place separately for male and female workers. The arrangements shall include:

i. A latrine for every 15 females or part thereof (where female workers are employed). A latrine for every 10 males.
ii. Every latrine shall be under cover and so partitioned as to secure privacy, and shall have a proper door and fastenings.
iii. The latrines and urinals shall be adequately lighted and shall be maintained in a clean sanitary condition at all times and should have a proper drainage system;
iv. Water shall be provided in or near the latrines and urinals by storage in suitable containers.
v. Hygiene in the camps should be maintained by providing good sanitation and cleaning facilities. Soak Pits can be provided only if labour camp is located away from river.
vi. Wastewater generated from these facilities will be disposed through septic tank (designed following Indian standard code of practice for installation of septic tanks IS: 2470) and soak pit/leach pit to meet the CPCB standards of class E.

1.6. Waste and Wastewater Management in Labour Camp:

i. As the project is located within the urban area of Dhanbad, the contractor will have access to healthcare facilities and clinics. Any bio- medical waste generated at the labour camp is likely to be minor in quantity, first likely to be generated at first aid centre, and shall be disposed of following the Bio Medical Waste Disposal Rules, 2016[1]

ii. Kitchen waste water shall be disposed into soak pits located preferably at least 30 meters from any water body/ drinking water source. The capacity should be at least

1

1.3 times the maximum volume of wastewater discharged per day. The bottom of the pit should be filled with coarse gravel and the sides shored up with board, etc. to prevent erosion and collapse of the pit.

iii. Municipal waste will be generated from labour camp, and the contractor will comply with the Waste management specifications in Annex V.

iv. Dustbins for recyclable and non-recyclable waste shall be provided in labour camp area. Recyclable waste shall be sold to authorized vendors and non-recyclable shall be disposed through authorized agency in area responsible for waste collection and management. The rejected waste should be disposed in a secured manner at the designated landfill site in Sijua at Dhanbad.

v. No dumping of waste/wastewater will take place on the surface/ ground. Hazardous waste or wastewater shall not be stored in unlined ponds.

vi. Wastewater generated from the washing/cleaning area after passing through oil & grease trap and curing area shall be re-used for water sprinkling and wheel washing.

vii. Wastewater from construction site should not be allowed to accumulate at site as standing water may lead to breeding of mosquitoes.

viii. Wastewater generated from labour camp will not be directed into river but should be treated and disposed through septic tank (designed following Indian standard code of practice for installation of septic tanks IS: 2470) and soak pit/leach pit to meet the CPCB standards of class E.

ix. Wherever septic tanks are not provided mobile toilets with anaerobic digestion facility shall be provided and no domestic waste shall be discharged to any water body.

x. Temporary storm water drainage system should also be provided at camp site and construction site to drain the storm water and prevent accumulation of storm water at site and thus breeding of mosquitoes/flies

xi. Solid wastes generated in the kitchen shall be reused if recyclable or disposed in land fill sites per waste management plan in Annex V

xii. All used oils, lubricants and machine oils will be stored in leak proof containers, and shall be placed on paved surface and disposed as per waste management plan in Annex V. Authorised vendors from Jharkhand Pollution control board will collect the waste oils, lubricants.

1.7. Provision of Rest and Emergency Assembly areas:

The work place shall provide four suitable sheds, two for meals and two for rest (separately for men and women). The height of the shelter shall not be less than 3.0m from the floor level to the lowest part of the roof. These shall be kept clean. Emergency Assembly Area

shall be demarcated as emergency collection area near the gate where all can assemble in case of fire, earthquake or calamity at the site.

1.8. Safe Access Road:

Temporary paved surface shall be constructed to approach the labour camp from the site. If camps are located close to residential and commercial areas, the roads should be watered sufficiently. Trucks carrying construction material to be adequately covered to avoid the dust pollution and to avoid the material spillage. Movement shall not be hampered during monsoon season due to water logging.

1.9. Medical and First Aid Facilities:

i. Medical facilities shall be provided to the labour at the construction camp. Visits of doctor shall be arranged twice a month wherein routine check-ups would be conducted for women and children. A separate room for medical check-ups and keeping of first aid facilities should be built. The site medical room should display awareness posters on safety facilitation hygiene and HIV/AIDS awareness.

ii. Ambulance/ 4-wheeler motorized vehicle shall be available at the site for carrying injured to the nearby hospital. Tie-ups should be made with nearby hospital to handle emergency, if any. Nos. of ambulance, doctors and nearby hospital shall be displayed in first-aid room, site office & labour camps. List of contact nos. of emergency personnel, hospitals, fire brigade and other emergency contact should be displayed at camp site, guard's room and first aid room.

iii. First Aid Box will be provided at every construction campsite and under the charge of a responsible person who shall always be readily available during working hours. He/she shall be adequately trained in administering first aid-treatment. Formal arrangement shall be prescribed to carry injured person or person suddenly taken ill to the nearest hospital.

The first aid box shall contain the following.

- 6 small sterilized dressings
- 3 medium size sterilized dressings
- 3 large size sterilized dressings
- 3 large sterilized burns dressings
- 1 (30 ml) bottle containing 2 % alcoholic solution of iodine
- 1 (30 ml) bottle containing salvolatile
- 1 snakebite lancet
- 1 (30 gm) bottle of potassium permanganate crystals

- 1 pair scissors
- Ointment for burns
- A bottle of suitable surgical antiseptic solution

In case, the number of labour exceeds 50, the items in the first aid box shall be doubled

1.10. Crèches

In case 20 or more women workers are employed, there shall be a room of reasonable size for use of children under the age of six years. The room should have adequate light and ventilation. A caretaker is to be appointed to look after the children. The use of the room shall be restricted to children, their mothers and the caretaker.

1.11. Storage of Construction Material in Construction Camps

For storage of Petrol/Oil/Lubricants, brick on edge flooring or sand flooring will be provided at the storage places of Petrol/Oil/Lubricants to avoid soil and water contamination due to spillage. These should be kept away from labour residential areas. The storage of cement shall be at Damp-proof flooring, as per IS codes. All materials shall be stored in a barricaded area. In case of electrical equipment, danger signs shall be posted. The batch mix plant is to be located away from the residential area and not in the wind direction. Separate parking areas for vehicles and also workshop areas need to be provided.

- Adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids.
- Impervious/paved surfaces should be used for refuelling areas and other fluid transfer areas to avoid soil and water contamination due to spillage.
- Training workers on the correct transfer and handling of fuels and chemicals and the response to spills
- Provide portable spill containment and clean-up equipment on site and training in the equipment deployment

Use of LPG Cylinders:

- Store filled gas/LPG cylinder in a secure area – mark this as a no smoking area.
- Transport, store, use and secure cylinders in upright position.
- Ensure proper ventilation at the ground level in locations where LPG is in use.
- Avoid physical damage to the cylinders.
- Never weld near the cylinder.

- Store empty cylinders secured and upright. Make sure that the cylinder is closed immediately after use.
- Investigate immediately if there is the smell of LPG or gas.
- Make sure that there is no other unrelated fire in the vicinity of the cylinder.

1.12. Firefighting arrangement

The following precautions need to be taken:

i. Demarcation of area susceptible to fires with cautionary signage;
ii. Portable fire extinguishers and/or sand baskets shall be provided at easily accessible locations in the event of fire; and inspect fire extinguishers regularly and replace as necessary.
iii. Contractor shall educate the workers on usage of this equipment.
iv. Store flammable material in proper areas having adequate fire protection systems.
v. Display sufficient warning signs.
vi. Install fire alarm wherever required and test regularly.
vii. Train selected personal on use of fire extinguishers
viii. Fire escape route should be kept clear at all times and clearly indicated
ix. Train workers about the escape route and assembly point/s. Carryout fire drill periodically.

When fire breaks out

x. Alert all persons through fire alarms or other methods.
xi. Put off the fire with appropriate fire extinguishers only when you are sure that you are safe to do so.
xii. Fire officers to carryout head count at the assembly point.

2. During Construction Activity

Construction camps shall be maintained free from litter and in hygienic condition. It should be kept free from spillage of oil, grease or bitumen. Any spillage should be cleaned immediately to avoid pollution of soil, water stored or adjacent water bodies. The following precautions need to be taken in construction camps.

i. Measures to ensure that no leaching of oil and grease into water bodies or underground water takes place.
ii. Wastewater should not be disposed into water bodies.
iii. Regular collection of solid wastes should be undertaken and should be disposed safely.

iv. All consumables as the first aid equipment, cleaning equipment for maintaining hygiene and sanitation should be recouped immediately.

v. The debris/scrap generated during construction should be kept in a designated and barricaded area.

vi. The PIU will monitor the cleanliness of construction campsites and ensure that the sites are properly maintained throughout the period of the contract.

2.1. Grievance Redressal System

A complaint register and a complaint box should be provided at the site so any person from local community can register their complaint, if any due of the camp, workers and other facilities. The system shall be communicated to local communities through consultations. Open house meetings should be conducted with workers on monthly basis to identify their problems and issues if any related to health, hygiene, safety, comfort and other issues. Activities prohibited at site

2.2. Activities which should be strictly prohibited at site shall include

i. Open burning of wood, garbage and any other material at sit for cooking or any other purpose

ii. Disturbance to the local community.

iii. Adoption of any unfair means or getting indulgence in any criminal activity

iv. Non-compliance of the safety guidelines as communicated be safety officials and during the trainings

v. Adoption and proper usage of PPEs all the time as required

vi. Operation of the plant and machinery between 10 pm to 6 am unless approved by team leader

vii. No animal (wild or domestic or bird) shall be harmed by any construction worker in any condition at site and nearby areas

viii. Cutting of tree without permission of team leader/authorized person

ix. No indigenous population shall be hurt or teased

3. Post Construction/Decommissioning Stage

After the completion of construction, all construction camp facilities, labour camps shall be dismantled and removed from the site. The site shall be restored to a condition in no way inferior to the condition prior to commencement of the works. Unrestored camp and yard sites

would cause aesthetic impacts and remnant contamination from fuel, oil or unused bitumen. Workers camp are also associated with fuel storage and dispensing, vehicle maintenance areas and workshops, offices and generator houses, vehicle wash bays and waste management/disposal. All these have potential for environmental contamination.

Various activities to be carried out for site rehabilitation include:

i. All temporary structures should be cleared
ii. Debris (rejected material), building debris, garbage, night soils and POL waste should be disposed suitably according to the construction debris and waste management plan.
iii. All disposal pits or trenches should be filled in, disinfected and effectively sealed off.
iv. All the areas within the camp site should be levelled and spread over with stored top soil. Residual topsoil, if any will be distributed or spread evenly in plantation sites, on adjoining/near-by barren land or affected agricultural land adjacent to the RoW that has been impacted on account of any accidental spillage.
v. Oil and fuel contaminated soil shall be removed and transported and buried in waste disposal areas.
vi. Underground water tank in a barren/non-agricultural land can be covered. However, in an agricultural land, the tank shall be removed.
vii. If the construction camp site is on an agricultural land, top soil can be spread so as to aid faster rejuvenation.
viii. Entire camp area should be left clean and tidy, in a manner keeping the adjacent lands neat and clear, to the entire satisfaction of landowner and JUIDCO.
ix. Proper documentation of rehabilitation site is necessary. This shall include the following:
    a) Photograph of rehabilitated site;
    b) Land owner consent letter for satisfaction in measures taken for rehabilitation of site;
    c) Undertaking from contractor; and
    d) Certification from Engineer in-charge of the PIU.

In cases, where the construction camp site is located on a private land holding, the contractor would still have to restore the campsite as per this guideline. Also, he would have to obtain a certificate for satisfaction from the landowner.

4. Inspection of Labour Camps

Labour camps will be inspected on fortnightly basis. The inspection will focus on the following:

- General observations on cleanliness;
- Drinking water availability with respect to source, cleanliness of storage tanks and quality to be consumed;
- Provision of sanitation facilities to water availability in toilets their cleanliness and drainage;
- Provision garbage segregation and disposal facilities.
- X no of toilets for x no of labour
- Provision of gas for cooking to avoid illegal wood gathering
- Rules to avoid poaching of wild life etc.

A format of inspection of labour camps is as shown in **Figure below**.

Figure 2: Format proposed to be used for Labour Camp Inspection

Inspection Report of Labour Camps

Date: _____ **Name of Contractor :_____**

Location: _____ **Nos. of Huts. :_____**

Colony Type: Main/ Temporary **Total Nos. of labour :_____**

Contact phone Nos.: _____ **Name site in charge :_____**

Sr.No: _____ **Nos. of toilets : _____**

GENERAL OBSERVATION		**Remarks**
Cleanliness in the camp साफ सफाई	Good/Satisfactory /Unsatisfactory	
DRINKING WATER		
Water Source पानी का स्त्रोत	IPH/Borewell	
Cleanliness of Storage tank पानी की टांकी की सफाई	Good/Satisfactory /Unsatisfactory	
Visual Quality of Drinking water पीने के पानी का सतर	Good/Satisfactory /Unsatisfactory	
SANITATION		
Toilets Condition शौचालय की हालत	Good / Satisfactory /Unsatisfactory	
Water Availability पानी का प्रबन्ध	Sufficient /Unsufficient	
Cleanliness शौचालय की सफाई	Good / Satisfactory /Unsatisfactory	
Drainage निकास का प्रबन्ध	Good / Satisfactory /Unsatisfactory	
Garbage disposal system कुडा करकट की साफ सफाई	Good / Satisfactory /Unsatisfactory	

Name & Signature of Investigation Team

Environment & Social Manager (Verified by)

ANNEXURE V: WASTE MANAGEMENT PLAN

Potential Sources of Waste Generation

The expected solid waste as per JUIDCO to be generated during construction phase and their disposal method is provided in the table below:

Table 8: Solid and Hazardous Waste- Construction Phase

S.No	Type of Waste	Estimated Quantity	Disposal
1.	Construction debris (excavated soil material, rocks, bricks, mortar, metals, wood and packaging wastes)	3-5 tonnes per day	Construction debris will be used to level low lying areas at approved site.
2.	Domestic waste including food wastes, sludge from septic tanks and household packaging wastes	90 kg per day	About 70% of the domestic waste is expected to be biodegradable waste from kitchen/food waste. Food waste will be disposed off for use for piggeries. Remaining domestic waste will be disposed of at a site as approved by local authority.
3.	Used Oil# from diesel generators and construction machinery	Approx. 5 tons per annum	To be disposed to JSPCB and CPCB authorised Vendors
4	Packing waste containing cardboard, wood etc.	20 tons per year	To be sold to scrap dealers

- Indicates Hazardous waste

* - The quantity will be for the entire construction period

Comprehensive Waste Management Plan

The contractor should prepare a Comprehensive Waste Management Plan to be submitted to JUIDCO for approval prior to setting up of construction and labour camp and it should comprise the following details:

- Categorization of waste into degradable, biodegradable and hazardous categories and list of different types of waste that falls in each of these categories.
- Estimates about the quantity of waste generated in each category and type of storage units required.
- Detail the provisions for storage and handling of waste until disposed.
- A plan of the respective camps / areas like construction camp, labour camp etc. to be submitted indicating in it the space allocated for storage and handling of wastes.
- Based on the type of wastes generated, treatment and disposal mechanisms should be presented. Measures for waste reduction, treatment and disposal should be implemented. Record of all disposal locations and potential disposal locations which require approval of the Supervising Engineer are to be presented. These should necessarily include details of:
    i. Disposal of cut-to-spoil indicating quantity generated, disposal and disposal locations
    ii. potential locations with photographs,
    iii. Trees cut during the progress of clearing and grubbing or other activities should be
    iv. presented,
    v. Waste concrete, bitumen, lime and lime bags indicating quantity expected to be generated and dispose,
    vi. Waste oils from service bay and oil spills as well as oil from cleaning of service bay
    vii. Oil and grease from vehicle washing bays,
    viii. Kitchen waste indicating quantity generated, quantity disposed and location of disposal
- Detail the precautions to be taken while storing, handling and disposing each type of waste, trainings to be imparted to workers to create awareness about waste management.
- Details of each debris disposal site: Copy of approved site identification report along with location plan on a village map showing the debris disposal sites, site, its survey no., access road, project stretch, distance from the project stretch, surrounding

features and land use like residences, agricultural land, water bodies etc., photograph of the site showing the topography and other existing features.

Precautions to be adopted during disposal of debris/waste material

The contractor shall take the following precautions during transportation and disposal of debris/waste material:

- A register should be kept for recording the details of the waste generated and their disposal.
- The contractor will take full care to ensure that public or private properties are not damaged/ affected during the site clearance for disposal of debris and the traffic is not interrupted.
- All arrangements for transportation during dismantling and clearing debris, considered incidental to the work, will be implemented by contractor in a planned manner as approved and directed by JUIDCO.
- In the event of any accidental spill or spread of wastes onto adjacent parcels of land, the contractor will immediately remove all such waste material/s and restore the affected area to its original state to the satisfaction of JUIDCO.
- Contractor should ensure that any spoils/materials unsuitable shall not be disposed off near any water course; water body; agricultural land; natural habitats like grass lands, wet lands, flood plains, forests etc. pasture; eroded slopes; and in ditches, which may pollute the surrounding including water sources.
- Contractor should ensure effective water sprinkling during the handling and transportation of materials where dust is likely to be created.
- Contractor Materials having the potential to produce dust will not be loaded beyond the side and tail board level and will be covered with a tarpaulin in good condition. •
- Any diversion required for traffic during disposal of debris shall be provided with traffic control signals and barriers after discussion with the local body and as approved by JUIDCO.
- During the debris disposal, Contractor will take care of surrounding features and avoid any damage to trees and properties
- No hazardous and contagious waste material shall be disposed at such locations.

Waste Disposal in Labour Camp

- Concrete flooring and oil interceptors should be provided for hot mix plant area, workshops, vehicle washing and fuel handling area.

- Petroleum, oil and lubricants waste shall be stored safely in separate containers and should be disposed off by transfer only to recycler/ re-refiners possessing valid authorization from the Jharkhand State Pollution Control Board.
- Used lead batteries, if any, should be disposed as per the Batteries (Management and Handling) Rules 2001.
- Water separated and collected from oil interceptor should be reused for dust suppression.
- There should be a register to record the details of the oil wastes generated at the workshops and oil storage areas.
- The municipal waste from the labour camp will only be routed through proper collection and handover to local municipal body for further disposal.
- No incineration or burning of wastes shall be carried out.
- Discarded plastic bags, paper and paper products, bottles, packaging material, gunny bags, hessian, metal containers, strips and scraps of metal, PVC pipes, rubber and poly urethane foam, auto mobile spares, tubes, tires, belts, filters, waste oil, drums and other such materials shall be either reused or will be sold /given out for recycling.
- Septic tank must be provided for toilets and the sludge should be cleared by municipal exhausters.

Disposal of bituminous waste

- At locations identified for disposal of residual bituminous wastes, the disposal will be carried out over a 60-mm thick layer of rammed clay so as to eliminate the possibility of leaching of wastes into the ground water.
- The Contractor will suitably dispose off unutilized non-toxic debris at pre-designated disposal sites, subject to the approval of JUIDCO.
- Debris generated from pile driving or other construction activities along the rivers and streams drainage channels shall be carefully disposed in such a manner that it does not flow into the surface water bodies or form puddles in the area.

Disposal of non-bituminous waste

- Non-bituminous wastes may be dumped in in barren lands, only after approval of JUIDCO/ULB
- Local tree species suitable for such re-habitation work shall be selected in consultation with local community.

Criteria for land selection for disposal of construction of Debris

For the purpose of disposal of debris, dumping site of the ULB situated at Sijua will be utilized.

Unusable materials and construction elements such as electro-mechanical equipment, cables, accessories and demolished structures will be disposed of in a manner approved by the Contractor and CSQC. The Contractor has to agree with CSQC which elements are to be recycled or reused, and which will be disposed of at approved landfill sites.

ANNEXURE VI: OCCUPATIONAL HEALTH & SAFETY MANAGEMENT PLAN

1. Assessment and Control of Occupational Health Risks

The Contractor shall carry out a Health Risk Assessment (HRA) of all construction activities for all chemical, physical, biological, ergonomic, emergency situations and psychological health hazards associated with work at the construction site having risks assessed as medium or high on the Risk Assessment Matrix based on which control measures should be selected, implemented and documented.

i. The environmental and occupational health and safety aspects and related emergency preparedness response can include incidence such as collapse of structure, trench, explosion, and other occupational accidents.
ii. The selection of controls should take account of the control hierarchy, i.e. Elimination, Substitution, Engineering, Procedural and lastly Personal Protective Equipment.
iii. Contractor shall develop the onsite emergency plan considering the potential environmental, occupational health and safety emergency at site and activities involved, and submit a copy of this plan to PIU and CSQC consultant before the start of the work. (this is also applicable for the operational phase of the water treatment plant)
iv. Construction staff shall be trained in the nature of the occupational risk, hazards and the specified controls and responses.
v. All records of emergency preparedness plan with emergency contact numbers, mock drills and corrective preventive action record after emergency is occurred
vi. The accident and incident records and emergency preparedness drill reports shall form part of quarterly report to the PMU
vii. Contractor shall be responsible to handle emergency condition and shall be liable to compensate the damage against accident, if any occurs at site.
viii. Project supervising engineers should inspect contractors‘ compliance with safety precautions during construction.

2. Chemical Hazards

The Contractor shall identify, assess and control all hazardous chemicals involved in the construction, including building materials, proprietary chemical products, fumes, dusts and gases emitted because of cutting and welding and sanding/grinding.

3. Physical Hazards

The Contractor shall assess the risks associated with physical hazards and eliminate them or control them to as low as reasonably practicable, applying the principles outlined below:

Noise

For operations under noisy conditions, the Contractor shall establish procedures in compliance with the Noise Guideline provided in "The Noise Pollution (Regulation and Control) Rules, 2000". The Contractor shall reduce noise from construction equipment by measures such as:

- Selecting machinery that has inherent noise reduction features;
- Periodic monitoring of sound levels and regular maintenance of equipment;
- Contractor shall conduct periodic monitoring of sound pressure at least once each quarter.

Vibration

Where exposure to vibration may affect part or all of the body, for example in the use of pneumatic drills, the Contractor shall ensure that exposures are assessed and eliminated or controlled.

Climatic Stress

For operations under extreme climatic conditions, the Contractor shall establish procedures in compliance with the relevant standards.

4. Biological Hazards

Where insects, mites and animals, moulds, yeasts, fungi, bacteria and viruses are present in the working environment, exposures to pathogenic biological agents shall be controlled such that diseases and ill health effects are prevented.

Malaria

When construction takes place in areas where malaria occurs, a comprehensive risk based malaria control program shall be in place encompassing all aspects of malaria prevention programs. Use of malaria prophylaxis is a must, comparable with wearing safety shoes and hard hats. The four components of malaria prophylaxis are:

- Awareness

- Be aware of the risk of malaria in the work locations or sites visited;
- Be aware of the signs and symptoms and know how long it takes to develop the illness after being bitten.

- Bite Prevention - Avoid being bitten by mosquitoes by:
  - Wearing long sleeved shirts and trousers when outdoors;
  - Using insect repellent (preferably containing the active ingredient DEET) and;
  - Using air conditioning whenever available or mosquito nets at bedtime in the absence of air-conditioning.
- Chemoprophylaxis - comply when advised by a competent health professional:
  - Take anti-malarial drugs (chemoprophylaxis) when appropriate, to prevent infection from developing into clinical disease. Although highly effective, note that anti-malarial drugs do not guarantee 100% protection;
  - Medications are safe to use if taken according to medical advice.
- Diagnosis and Treatment
  - Early diagnosis and treatment can prevent fatalities. Seek immediate diagnosis and treatment if a fever and/or flu-like symptoms develop one week or more after entering and up to 3 months after departure from a risk area;
  - Inform your doctor of recent travel to a malaria risk area;
  - Owner should closely monitor performance of these Malaria control programs.

Legionella bacteria

Water systems may support the growth of legionella bacteria. These bacteria can enter the human body when contaminated water is inhaled as a spray, and may cause infection in the form of Pontiac Fever or Legionnaires 'disease. Known sources of legionella-contaminated water on construction sites, which may lead to infection, include:

- Domestic water storage tanks;
- Pipe work including dead legs and intermittently used water services;
- Personal and safety showers, pipe work and heads;
- Fire water and other water storage tanks;
- Water supplies used for suppressing road dust etc.;
- Water cooling systems for air conditioners;
- Water jetting equipment

The Contractor shall appoint a competent person to assess the risk of legionella and to implement the control measures.

Pest and Insect Control

Typical pests are flies, mosquitoes, rats and snakes. Effective cleaning and good housekeeping of worksite and workers camps is the basis of any pest control programme. In addition to providing Long Lasting Impregnated Nets. The Contractor shall employ a specialist Subcontractor to provide a pest control service for the worksite and workers camp, to the Contractor's specification.

Where the pest control is not subcontracted; the Contractor shall provide proper equipment and pesticides and shall train one or two employees in the operation of spraying equipment and on safe handling of pesticides. This may require provision of appropriate personal protective equipment, e.g. coveralls, impervious gloves, eye and respiratory protection. The Contractor shall monitor the pest control service.

5. Ergonomic Hazards

The use of good manual handling and lifting techniques for construction materials minimises back and other related injuries. The Contractor shall therefore instruct workers in correct posture and lifting techniques.

i. Avoid manual handling of heavy and hazardous objects and chemicals.
ii. Pre-assess the actual requirement of manpower in case of emergency situations.
iii. The hazardous and poisonous materials should not be manually handled without proper equipment's/gears and prior declaration of the risks needs to be made to the involved workers.
iv. All concerned persons shall be trained in proper methods of lifting and carrying.
v. In all manual operations where groups of workers are involved, a team leader with necessary training to handle the entire work force in unison has to be provided for.
vi. Watch and ward to control/ supervise/ guide movement of equipment's and machineries, loading and unloading operations, stability of the stockpiled materials and irregularly shaped objects have to be provided for safety and security of workers.
vii. Carriageway used by the workers must be free from objects, which are dangerous.
viii. Loading and unloading from vehicles shall be under strict supervision.

6. Psychological Hazards

Work Plan and Organisation

The Contractor needs to be assured that all relevant and appropriate good working practices are being followed. To plan the work so as to maximise efficiency and so as to optimise human efforts the following shall be considered:

- Work cycles/shift work, taking account of local legislation
- Circadian (daily) rhythms of the working population

Working Hours and Working Cycles

Regular long working hours and shift work can promote fatigue. Fatigue can lead to reduced mental function and vigilance. As a result, there will be an increased likelihood of accidents and ill health. Most construction activities carry a safety risk and this shall not be aggravated by serious fatigue because of excessive overtime. As a minimum, the Contractor shall follow local legislation and ILO/UN recommendations on maximum working hours. The Contractor shall assess all the risks associated with the extended working hours and shift cycles and shall agree with the Owner the working hours and working cycles to be applied on the specific project.

The Contractor shall set up a system to monitor that Subcontractors are also following the agreed working cycles

7. Monitoring of Health Performance and Incident Reporting & Investigation

The Contractor shall have health monitoring systems in place. A medical file shall be kept for each employee. This file should include details of the pre-employment fitness to work assessment, details of any subsequent first aid treatments or clinic visits, and details of any medical surveillance that may be undertaken. The Contractor shall monitor:

- Injury
- Accident – causes
- Death
- Occupational illness cases and frequency;
- First aid treatment cases;
- Number of individuals' undergoing medical surveillance;
- Number of health audits;
- Number of health-related training courses;
- There may be a requirement to monitor and report specific illnesses, if required by the specific health management plan.

Contractors shall investigate health incidents and non-accidental deaths, involving their staff in the same way as they are expected to investigate and report safety incidents. This parameter will be submitted as part of environmental monitoring plan.

8. Fitness to Work

The Contractor shall identify all worker groups whose specific work or working conditions require a minimum fitness for duty standard.

9. Local Health Facilities and Medical Emergency Response

i. The Contractor shall provide access to suitably equipped and staffed hospitals.
ii. The Contractor shall provide medical centre and first aid arrangements that comply with the Medical Emergency Guidelines. Particular attention shall be paid to ensuring that the required first aid response times are achieved and should be verified by drills.
iii. The Contractor shall develop a site-specific plan based on the health risk assessment, which describes the response to various medical emergency scenarios and medical evacuation procedures. The Contractor shall arrange for regular drills to practice and learn from the various emergency scenarios.

10. Traffic Safety

i. Delineate warning zones, transition zones and construction zones at both ends of a work front. Use devices such as regulatory signs, delineators, barricades, cones, pavement markings, lanterns and traffic control lights, reflectors and signal men in appropriate manner around the clock.
ii. Put signage at appropriate locations as per the road construction activity plan to warn the road users, construction vehicles/equipment operators, pedestrians and local residents about the work in progress, speed controls, hindrances/ blockages, diversions, depressions etc. in lines with contract requirements and IRC guidelines.
iii. Express a regret signage for the inconvenience caused and alert about the dangers ahead on account of construction activity. Signage has to be: (i) simple, easy-to-understand and should convey only one message at a time; (ii) has florescent and reflective properties of the paints; iii) broad, prominent and with appropriate size of letters and figures; (iv) placed at the appropriate 'point/s' as specified in the IRC guidelines to allow proper stoppage/reaction time to approaching vehicles.
iv. Different sign boards shall have a mix of pictorial signs and messages in local language, Hindi and English.
v. While using barricades, ensure that traffic is kept away from work areas and the road user is guided to the safe, alternative movement track.
vi. Ensure that excavation sites are provided with effective barriers and reflecting signage to prevent any accidental approach by vehicles during the day or night.

vii. Prevent entry of cattle and wildlife through proper fencing/barricading around the excavation sites.

viii. Provide proper uniform (light reflecting garments) to flagmen engaged in traffic control at diversions so that they can be singled out from the moving traffic.

ix. Provide wide red and green flags or red and green lights to flagmen for controlling traffic.

x. In high traffic zones and congested areas, use of wireless communication devices with protective headgear and shoes by flagmen has to be ensured to prevent confusion and minimize the risk of accidents.

11. General Health and Safety

Drinking Water

Drinking water standards should meet those in the latest edition of Guidelines for Drinking Water Quality – WHO(IS:10500). The Contractor shall provide sufficient potable water calculated at 30 litres per person per day, plus at least five days emergency supply.

Garbage Collection

i. The Contractor shall provide a suitable system for garbage collection and disposal. Spillage of refuse should be prevented. Arrangement shall be made for a daily collection of food wastes for collection of refuse from living quarters and work sites not less than twice weekly.

ii. A sufficient number of fly-proof and rodent proof bins or containers shall be supplied to all food establishments, and to camp areas and work sites to maintain cleanliness. Bins shall be cleaned immediately after being emptied.

iii. Disposal of garbage shall meet local legislative requirements and public health standards.

12. Precautions to be taken while performing high risk tasks

Tree Cutting

i. Use hard hats and PPE during tree felling, wear appropriate foot protection

ii. Ensure safe use and storage of tools such as axes, power chain saw, hand saw of different types, HDPE ropes of approved thickness to drag felled trees and logs. Keep the saw blades in proper lubrication and sharpened state for efficient workability.

iii. Determine proper foot and body position when using the implements for felling, cutting and dragging.

iv. Avoid cutting tree branches overhead.

v. Keep first aid kits ready at the site.

vi. Determine possible hazards in the area, e.g. electrical or telephone or other utility lines, buildings, vehicles and domestic cattle that may create unsafe work situations.

vii. Prior to felling, determine the safest direction of fall and orient fixing of ropes and Cutting positions accordingly.

viii. Determine the proper hinge size before directing the fall.

ix. Keep machineries and workers ready for speedy removal of the tree from the main traffic movement area.

x. Keep flag men and warning signal signage at either end of felling area to control movement of traffic and warn passers-by.

xi. Use loud noise signals for warning by-standers and workmen about the impending fall, so as they move away from the direction of fall.

Electrical Work

i. Statutory warning leaflets/posters are to be distributed/displayed by the contractor in the vicinity of work sites for the benefit of all workers, officers and supervisors as well as the public, indicating the do's and don'ts and warning related to electrical hazards associated with operations to be executed/in progress.

ii. All wires shall be treated as live wires. The workers shouldreport about dangling wires to the site-in-charge and do not touch them.

iii. Only a qualified electrician should attempt electrical repairs.

iv. Train all workers about electrical safety.

v. Shut down the equipment that is sparking or getting over heated or emitting smoke at the time of operation, if it is not the normal way of working of such machines

vi. Never used damaged wires for electrical connection

vii. Demolition, tree felling and removal of overhead transmission lines shall be undertaken with strong, efficient and closely monitored arrangements to avoid accidents.

Operating Excavators

i. Ensure that excavators are operated by authorized persons who have been adequately trained. Prevent any unauthorized use of the excavators.

ii. Ensure that only experienced and competent persons are engaged in supervising all excavations and leveling activity.
iii. Issue relevant information, including that related to instructions, training, supervision and safe system of work in writing and provide expert supervision for guidance.
iv. Ensure that the operation and maintenance manuals, manufacturer's specifications, inspection and maintenance log books are provided for the use of the mechanics, service engineers or other safety personnel during periodic maintenance, inspection and examination.
v. During tipping or running alongside the trenches, excavators must be provided with stop blocks.
vi. Avoid operating the machine too close to an overhang, ditch or hole, potential carving in edges,
vii. Excavators must be rested on firm ground after field operation away from the road
viii. Locate and identify underground services including telephone cables, OFC cables, sewerage and drainage lines, water supply, electrical cables etc by checking with all concerned underground utility providers.
ix. When reversing or in cases where the operator's view is restricted, adequate supervision and signaling arrangements shall be provided.
x. Ensure that the type and capacity of the excavator are properly chosen for the intended purposes and site conditions. Never use a machine for any purposes other than it is designed for.
xi. Check and report for excessive wear and any breakage of the bucket, blade, edge, tooth and other working tools of the excavator and ensure replacement/ repair to avoid mishap and break down.
xii. Check that all linkages/hinges are properly lubricated and ensure that the linkage pins are secured. Never use improper linkage pins.
xiii. Never dismount from or mount on a moving machine.

Plant Sites and Construction camp

i. Install perimeter fencing.
ii. Ensure good visibility and safe access at site entrances. Provide adequate warning signs at the entrance and exit, as necessary.
iii. Provide adequate space/area for loading and unloading, storage of materials, plant and machinery.
iv. Display emergency procedure and statutory notices at conspicuous locations.
v. Provide areas for collecting garbage and other waste material, and also arrange for their regular/periodic disposal

vi. Arrange appropriate storage, transportation and use of fuel, other flammable materials and explosives in line with the license requirements obtained from concerned authorities.
vii. Provide defined access roads and movement areas within the site.
viii. Ensure availability of first aid facilities and display notices at various work places showing the location of first aid facilities and emergency contact numbers. Provide and enforce use of PPE at plant and quarry sites.

Night Time Working

It should be determined and stated clearly in the OHS management plan the responsibility of each individual at construction site for night time works. Project Manager, Engineers, Designers, Safety Officer and Site Supervisors as well as workers each have their specific responsibility to make sure the highest level of priority are given towards safety and health issues.

i. Before night works are carried out, the contractor (verified by CSQC) should check the inventory of safety equipment to make sure they are sufficiently available, appropriate, and in good working condition. Equipment's such as retro-reflective signage, barriers, retro reflective tapes and lighting equipment are some example of safety equipment that should be provided for night time construction works
ii. Contractors should identify at which construction phase the need for night time work is required and allow for shift rotation and inform workers of the "special" hazards and risks at night to allow effective adaptation with the work environment
iii. All the signage's and barricades will be maintained properly and kept clean, barricades should contain reflector.
iv. Proper lighting arrangements for illuminating these signs will be made during the night hours. Night time construction lighting arrangements have an impact on project safety, quality, cost, and productivity and influences human performance and alertness.
v. It is also recommended to send workers for health screening to make sure the workers are fit to work at night. Allowing an unfit worker to work at night will endanger the worker and other worker in the same work area.
vi. All traffic control devices will be clearly visible by day and night, at these speeds and under the usually prevailing climatic conditions. Traffic cones and cylinders will be

reflectorized for use at night and will never be placed in the roadway without advance warning signs.

vii. When overhead crane is operating near the public, clear off the area and make sure adequate supervision is in place.

viii. Road danger lamps will be placed at the ends of the barriers at night.

ix. Prismatic Retro Reflective Sheeting can be used to enhance the visibility of traffic control signs and objects under all driving conditions, day and night.

x. Noise barriers (absorptive type noise barriers, either alone or in combination with reflective type), will be created near sensitive noise receptors and construction site. Arrange noisy equipment or machinery at farthest point from the public or adopt an engineering control to reduce the Noise

Emergency preparedness and response planning

The 'On-site emergency plan' to be prepared by contractor and shall include minimum the following information:

i. Site Locations

ii. Name, Designation & Contact Numbers of the organization, nearby hospitals, fire agencies etc. and key personnel including their assigned responsibilities in case of an emergency.

iii. Site Layout Diagram showing location of fire extinguishers, emergency collection area and fire alarm

iv. Identification of Potential Emergencies Situations/ preventive measures / control & response measures

v. Medical services / first aid

vi. List of emergency equipment including fire extinguishers, fire suits

ANNEXURE VII: MONTHLY ESMP REPORT BY PIU

INTRODUCTION –_____TOWN

Name of Sub-Project:

Name of ULB:

The components taken up for _____ town are detailed in the following Table.

Package	Particulars	Status	Date of Award	Date of Completion

The status of Environmental and Social Management Plan (ESMP) for the month _____ year _____are presented in the following sections

PERMISSIONS/CONSENTS/CLEARANCES/APPROVALS:

S.no	Particulars	Status
1.	Forest	
2	Railways	
3	ASI	
4	Irrigation	
5	WRD/Source	
6	CTO	
7	CTE	
8	Ground water extraction for construction activity	
9	EC if required	
10	Others	

FIELD VISITS & TRAINING CONDUCTED

	Date	Sites Visited	Persons Met	Remarks
Field Visit/ Training				

COMPLIANCE TO EMP[2]

Particulars	Complied	Compliance to EMP
Pre-Construction Phase	□	
Construction Phase	□	
Monitoring Requirements & Specifications	□	

REDRESS OF GRIEVANCES/ COMPLIANT HANDLING

Sub Project	Registers Maintained	No. of Grievances received in the month	Action Taken

LABOUR REGISTRATION AND LICENSES OBTAINED

Sub Project	Labour license obtained (no. of labour)	Total labour registered/working on the project on the date of inspection	M/F	Local/Migrant

ACCIDENTS ON SITE

[2] **Insert Construction Stage EMP table here and provide compliance status, and Recommendations for each EMP measures and environment monitoring reports**

Sub Project	Total accidents in project site/camps etc. this months	Fatal/serious injury	FIR available	Action taken

TEMPORARY IMPACTS ON STRUCTURES AND LIVELIHOODS

Sub Project	Total affected identified so far.	PAH identified this month	ARAP/RAP/SMP approved so far	Received entitlement so far.

ENVIRONMENTAL MONITORING

AMBIENT AIR MONITORING

Location:

Date of Monitoring:

S.No	Parameter	Observed Value	NAAQS Standard	IFC Standard

Water Quality Monitoring

Location:

Date of Monitoring:

S.No	Parameter	Observed Value	IS:10500 Values	

AMBIENT NOISE MONITORING

Location:

Date of Monitoring:

S.No	Parameter	Observed Value	NAAQS Standard	IFC Standard

WASTE

S.No	Waste	Quantity	Disposal Method
1	Solid Waste		
2	Construction Waste		
3	Hazardous Waste		
4	Labour camp waste		

TREE PLANTED

S.No	Species Panted	Quantity

SUMMARY AND CONCLUSIONS

EMP monitoring being done daily on the critical issues and following improvements/ positive developments are observed.

S.No	Details	Compliance Status
1		
2		
3		
4		
5		

However, the following issues need to be addressed.

S.No	Issues/Deviations	Compliance status last visit	Corrective Actions to be taken	Compliance status during this month

1				
2				
3				
4.				
5				

ANNEXURE VIII: SCOPE OF WORK FOR ENVIRONMENT, SOCIAL, HEALTH AND SAFETY SPECILIST IN CSQC TEAM

1. The CSQC team will include a suitably qualified Environment Social Health and safety Specialist (ESHS) to undertake the day-to-day supervision of contractors in all matters concerning compliance with the ESMP, and the occupational health, safety (OHS), Waste Management, Labour Camp Management and Labour influx and child labour etc...
2. The PIU's safeguards officers will provide independent oversight and inputs to the CSQC Consultant with regard to all aspects of environmental and social compliance, for the CSQC Consultant to have addressed on the project through their role.
3. The JMDP PMU will undertake at least quarterly inspections of the construction sites, accompanied by the CSQC safeguard specialists. The Environment and Social Specialist shall prepare a joint quarterly report to be agreed by all parties clearly identifying actions to be taken to improve safeguards compliance.
4. Prior to any contractor commencing civil works the CSQC ESHS specialist shall in consultation with the PMU:

5. Review and Clear the Contractor's ESMP to ensure that it meets that it meets the requirements of: (i) the respective ESMPs; (ii) fully complies with relevant national laws, including any conditions of consent; (iii) meets the World Bank's Environmental, Health and Safety (EHS), and applicable IFC industry Sector Guidelines and environmental and social safeguards policies of WBG

6. Review and Clear the Contractor's OHS Plan. This shall be consistent with the projects ESMP OHS requirements, as well as the World Bank's EHS guidelines, and applicable IFC industry Sector Guidelines.

7. The environmental and social specialist of PIU shall report to the PMU environemal and social specialists if any changes to project design or construction methods which would trigger an update to the Project ESMP, RAP and STPP. Changes to works or methods should be assessed against the existing Project Area of Influence (PAI), Corridor of direct impact (CoI) and whether there is a likely public interest aspect to the changes. If either the PAI (geographically, socially or environmentally) has changed or CoI has changed substantially or if there is a public interest element to the changes then the safeguard instruments shall be updated.

8. CSQC shall regularly update JUIDCO PIU and PMU on progress with the contractor's applications for permits or consents as relevant under local laws or regulations.
9. CSQC shall Supervise the management of the Contractors labour in all matters concerning occupational health, safety and care of the works and workers, including HIV/AIDS prevention, gender based violence (GBV).
10. CSQC shall ensure that the contractor is adhering to the day-to-day requirements of the ESMP, the environmental and social safeguard requirements under GoI laws (including conditions of consent), and the World Bank's occupational health, environmental and social safeguards policies.
11. CSQC shall ensure that any workers camps are established and managed in accordance with the recommendations of the ESMP and the guidance contained in the IFC Guidance Note on Worker's Accommodation.
12. CSQC shall issue instructions to the Contractor to address any ESMP non-compliance issues.
13. CSQC shall submit monthly progress report and support PIU in preparation of quarterly safeguard progress reports in an agreed format covering all aspects of the project supervision, including project progress, testing results, occupational health and safety, ESMP compliance, incidents, near misses, summary of grievances / complaints and actions taken, upcoming or potential issues to be any consultation undertaken, relevant training, and compliance with permits and consents.
14. CSQC shall provide support to contractor, PIU to consult with the communities and stakeholders in accordance with the consultation plan in the ESMP

15. The Safety Officer is responsible for monitoring and assessing hazardous and unsafe situations and developing measures to assure site safety. The officer will correct unsafe acts or conditions or stop unsafe acts when immediate action is required, and can terminate all imminently dangerous operations immediately. Prepare reports on dangerous occurrences and serious incidents/accidents.

16. The safety officer is in charge of inspecting active work sites to determine if hazards are present and to establish procedures and policies to overcome those hazardous situations. The safety officer looks for broken equipment, defective tools, and other potential hazards, focusing on worker safety. The safety officer determines what type of personal protective equipment (PPE) is needed and makes sure that workers know how to operate and use tools and equipment.

17. The safety officer's main responsibility is to diminish or eliminate work-related accidents which may occur through (a) Usage of faulty equipment and electrical cord extensions (b) fatality and accidents during trenching and excavating (c) working at height, elevated surfaces, and night time and (d) The safety officer shall be responsible for attending any safety requirements on the road in case of emergency or otherwise. He shall also be responsible for coordinating ambulance services, tow crane services, road clearance due to any accident and removal of broken down vehicle to truck bays and regular routine patrolling.

18. If an accident occurs, the safety officer will also conduct a safety investigation to determine root causes, what procedures may have gone wrong, and to gather the evidence necessary to identify the cause of the accident. Based on investigation results, the safety officer will document findings and recommendations that should be followed to prevent the accident from happening again.

ANNEXURE IX: ENVIRONMENT & SOCIAL IMPACT ASSESSMENT METHODOLOGY

METHODOLOGY USED FOR THE IDENTIFICATION OF POTENTIAL RISKS AND IMPACTS

This chapter proposes the standardised methodology for impact identification to ensure consistency between the ratings of impacts in future ESIAs to be developed for sub-projects.

DETERMINATION OF BASELINE CONDITIONS

Baseline conditions should be documented to establish prevailing biophysical and socio-economic situation upon which impacts to be assessed and provide a basis for future monitoring. Baseline conditions are to be established using a combination of methods including detailed document review, observation, and interviews, biological and social surveys.

IMPACT IDENTIFICATION AND ANALYSIS

Impact Description

An impact is any change to a resource or receptor brought about by the presence of a project component or by the execution of a project related activity. The relevant impact characteristics included whether the impact is:

- Adverse or beneficial;
- Direct or indirect;
- Short, medium, or long-term in duration; and permanent or temporary;
- Affecting local, regional or global scale; including trans-boundary

Table 9: Impact Characteristics

S.No.	Impact Characteristics	Definition
1	Adverse	Causes adverse change from the baseline, or introduces a new undesirable factor.
2	Beneficial	Causes improvement on the baseline or introduces a positive change.
3	Direct Impact	Impacts that result from a direct interaction between a proposed project activity and the receiving environment/receptors
4	Indirect Impact	Impacts that result from other activities that are encouraged to happen as a consequence of the proposed project

Impact Severity

Impact severity is a function of the extent, duration and sensitivity of receptor. The definition of extent, duration and intensity to consider for determining impact severity has been presented in **Table 10**.

Table 10: Parameters to consider for impact severity

Sl.No	Classification	Description
1	Extent	Evaluation of the area of occurrence/influence of environmental impact; Extend can be defined as limited (within 2 km radius of the site); local (within 5 km radius of the site); regionally (district wide, nationally or internationally).
2	Duration	Defines the time which a receptor will be affected. Temporary (<1 year); short term (1 – 5years); medium term (5 – 10 years); long term (>10); or permanent.
3	Sensitivity of receptor	*High sensitivity:* Entire community affected (more than 100 households affected), presence of world heritage and important cultural sites, presence of water body used by community within 50 m of project footprint, presence of ecological sensitive area, national park or wild life sanctuary within 2 km of project site *Medium sensitivity:* More than 50 and less than 100 houses affected, presence of forest area within 5 km, presence of water body used by community within 50-100 m of project footprint. *Low sensitivity:* No displacements, no potential for stakeholder conflict, less than 50 household affected, water body used by community present within 500 m of project footprint, no livelihood impact, no livelihood impact

Based on the above table, impact severity is calculated as presented below:

- Very low: Environmental changes are within the existing limits of natural variations
- Low: Environmental changes exceed the existing limits of natural variations. Natural environment is completely self-recoverable.

- Medium: Environmental changes exceed the existing limits of natural variations and results in damage to specific environmental components. Natural environment remains self-recoverable.
- High: Environmental changes result in significant disturbance to specific environmental components and ecosystems. Certain environmental components lose self-recovering ability.

Probability of occurrence

The probability of occurring an impact is described below:

- Unlikely - The impact is unlikely to occur.
- Likely- The impact is likely to occur under most conditions.
- Definite-The impact will occur

Impact Significance

Impact significance is determined from an impact significance matrix(**Table 11**) which compares severity of the impact with probability of its occurrence.

Table 11: Impact significance

		Probability of occurrence		
		Unlikely	**Likely**	**Definite**
Severity of impact	Very low	Negligible	Negligible	Minor
	Low	Negligible	Minor	Minor
	Medium	Minor	Moderate	Moderate
	High	Minor	Moderate	Major

Impact significance criteria are as follows:

- Major: These denote that the impact is unacceptable and further mitigation measures must be implemented to reduce the significance.
- Moderate: Impacts in this region are considered tolerable but efforts must be made to reduce the impact to levels that are as low as reasonably practical.
- Minor: Impacts in this region are considered acceptable
- Negligible: Impacts in this region are almost not felt

ANNEX X: CHANCE FIND PROCEDURE

Excavation in sites of known archaeological interest should be avoided. Where this is unavoidable, prior discussions must be held with the relevant Authority (ASI) in order to undertake pre-construction excavation or assign an archaeologist to log discoveries as construction proceeds. Where historical remains, antiquity or any other object of cultural or archaeological importance are unexpectedly discovered during construction in an area not previously known for its archaeological interest, the following procedures should be applied:

a) Stop construction activities.

b) Delineate the discovered site area.

c) Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remains, a guard should be present until the responsible authority takes over.

d) Notify the responsible archaeologist. Who in turn should notify the responsible authorities, the ASI and local authorities (within less than 24 hours). Responsible authorities would oversee protecting and preserving the site before deciding on the proper procedures to be carried out.

   The significance and importance of the findings will be assessed per various criteria relevant to cultural heritage including aesthetic, historic, scientific or research, social and economic values.

a) Decision on how to handle the finding will be reached based on the above assessment and could include changes in the project layout (in case of finding an irrevocable remain of cultural or archaeological importance), conservation, preservation, restoration or salvage.

b) Implementation of the authority decision concerning the management of the finding.

c) Construction work could resume only when permission is given by ASI after the decision concerning the safeguard of the heritage is fully executed.

In case of delay incurred in direct relation to Archaeological findings not stipulated in the contract (and affecting the overall schedule of works), the contractor may apply for an extension of time. However, the contractor will not be entitled for any kind of compensation or claim other than what is directly related to the execution of the archaeological findings works and protections

These procedures must be referred to as standard provisions in construction contracts, when applicable. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered are observed.

The relevant findings will be recorded in the EMP monthly progress report, and quarterly safeguards report to the World Bank to assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.