

# Himachal Pradesh State Roads Transformation Program

(Under Funding Assistance of the World Bank)

Mandi – Rewalsar – Kalkhar Road  
(Km 0.00 to KM 28.00)

**Environment and Social Management Plan**  
(Final Report)

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Report Prepared by:

Deccan Consulting Engineers Private Limited, New Delhi  
(Independent ESIA Consultant to HPRIDCL)



**HIMACHAL PRADESH ROAD & INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED**  
(Government of Himachal Pradesh Undertaking)  
(An ISO 9001:2008 QMS & ISO 14001:2004 EMS conforming company)

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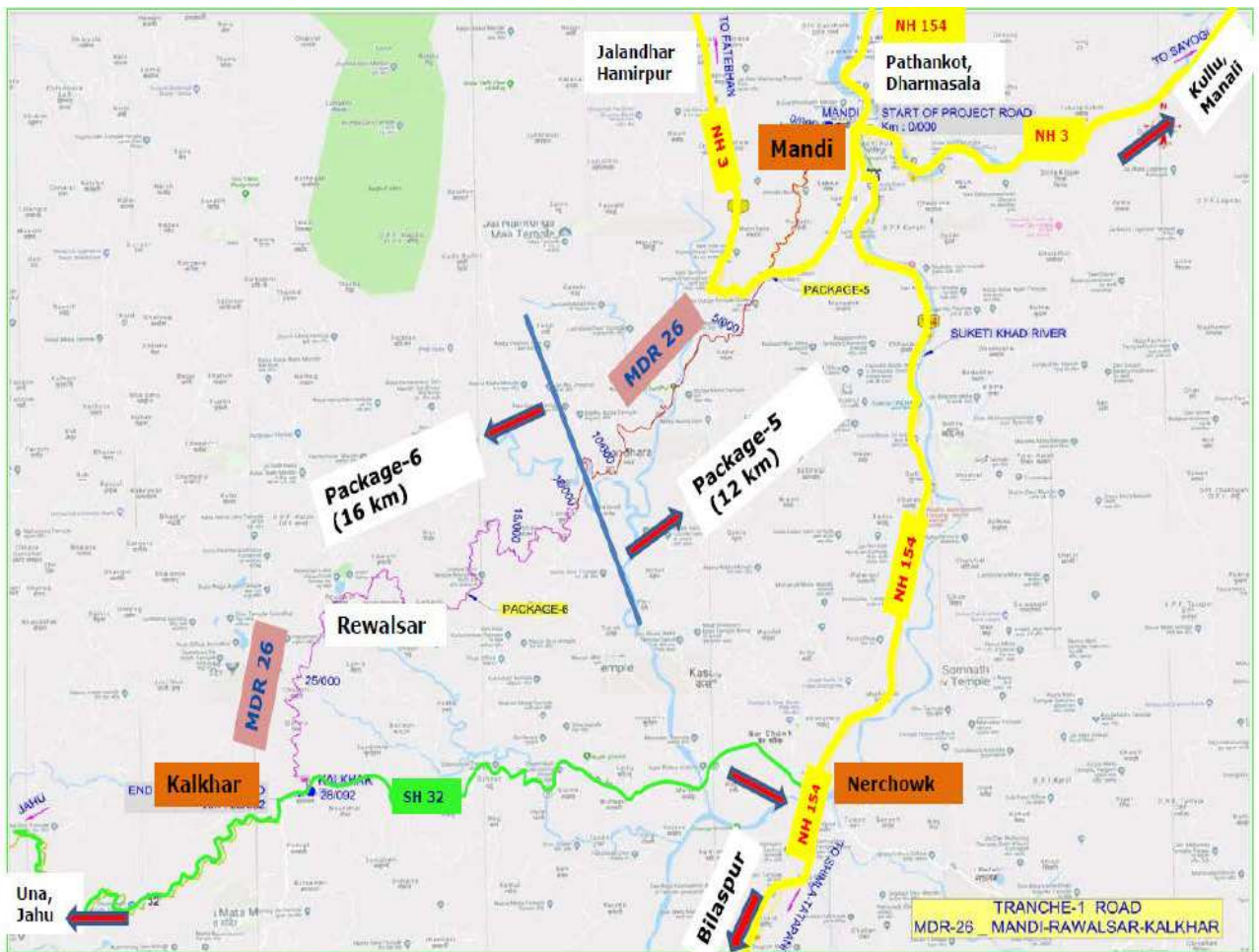
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# 1. INTRODUCTION

## 1.1 Project Road

1. The Mandi – Rewalsar- Kalkhar road is 28+000 Km and is designated as MDR-26 (Major District Road). The project road starts from Mandi town and ends at Kalkhar and traverses entirely within Mandi Tehsil of Mandi district. Project road connects to NH -154 at 0 km, NH-3 at Km 4.5 (Talyahar) and MDR 84/old SH 32 at Km 29 (**Figure 1-1**). The latitude and longitude of the project road at Mandi and Kalkhar are 31.707°N to 31.632°N and 76.930°E to 76.833°E respectively. The altitude of project corridor from Mandi to Kalkhar ranges between 850-1350 m above mean sea level (MSL).

2. There are 26 settlements along the project road. Some of the big settlement areas along the project road are Mandi, Panjethi, Talyahar, Ghera, Gaddel, Rattipul, Raghwanoo, Randhara, Gambharpul, Rewalsar, Kalkhar. Out of the total 28 km length, the built-up areas of the settlements extend to 9 km, which is about 32% of the road length. There are 18 junctions along the project road out of which 2 are major junctions and the rest 16 are minor junctions. The existing carriageway width varies from 3.1m to 7.2m all along the project road.



**Figure 1-1: Location Map of Mandi -Rewalsar- Kalkhar Project Road**

## **1.2 Associated Facilities of Tranche I - HPSRTP**

3. At present four bridges (3 minor and 1 major bridge) are under construction at different chainages along the 28 km long Mandi-Rewalsar-Kalkhar road by HPPWD and funded through the Central Road Fund (CRF) of Government of India (GoI). The Mandi Rewalsar Kalkhar is one of the four corridors under Tranche I and the four bridges, which are under construction meets all the three criteria set out in the ESF Policy of the World Bank to qualify as 'Associated Facilities'.

4. Since the qualifying Associated Facilities, mentioned above is not under the funding by any other multi-lateral or bi-lateral funding agencies, requirement for a common approach for the assessment and management of environmental/social risks and impacts will not apply. Further, the ESF policy stipulate that the qualifying Associated Facilities shall meet the ESSs requirements, to the extent that the borrower (HPRIDCL) has control over such Associated Facilities.

5. In present case, HPRIDCL has no direct control over the qualifying Associated Facilities', i.e., four bridges under construction by HPPWD. Although, HPRIDCL resolve itself to undertake certain passive mitigation measures, if any warranted at all the 4 bridge locations, since these bridges are integral to the Mandi-Rewalsar-Kalkhar corridor. Such mitigation measures can comprise river/stream bed clean up and profile restoration (up to 500 meters on both upstream and down steam sides), riverbank protection works through both engineering and nature-based bio-engineering solutions (up to 100 meters on both upstream and down steam side) and road safety measures. However, HPRIDCL has no jurisdictional control over the discharge of untreated sewage/sullage directly into river/steam(s) and dumping of construction debris and/or municipal waste into river/streams by the local community from the nearby settlement areas, shops and establishments at all locations.

## **1.3 Objectives**

6. The main objective of Environment and Social Management Plan is to mitigate the various adverse impacts and enhance positive impacts of the project road. The objectives at various stages of the project planning, design and implementation stages are as follows.

### **Design Phase**

- To address the preconstruction adverse social impacts such as impacts on private assets – residential, commercial structures etc., and CPRs through commensurate mitigation measures.
- To minimize impact on roadside trees and vegetation cover.
- To incorporate safety of road users and roadside communities in project design.
- To provide mitigation measures to all anticipated environmental degradation.
- To develop a design that incorporate environmental safeguards.

### **Construction Stage**

- To prevent and reduce the negative environmental impacts of the project by implementing the mitigation measures to be carried out by the contractor.
- To ensure that the provision of the ESMP (Environment & Social Management Plan) are strictly followed and implemented by strengthening implementation arrangement.
- To address the construction stage social impacts arising due to various project activities en-route the corridor and particularly at habitations through specific measures that need to be applied across and certain specific measures that shall be determined on a case-by-case basis.

### **Operation Stage**

- To monitor deterioration of natural environmental components of air, water, soil and noise, etc.
- To improve the safety of road users and the roadside communities.

#### **1.4 Scope of ESMP**

7. Environment and Social Management Plan (ESMP) consists of the set of mitigation, monitoring and institutional measures to be taken during the design, construction and operation phase of the project road to eliminate adverse social and environmental impacts, to compensate them, offset them, or to reduce them to acceptable levels in accordance with the mitigation hierarchy. The plan also includes the actions needed for the implementation of these measures.

#### **1.5 Context for ESMP**

8. This Environmental & Social Management Plan for Mandi- Rewalsar- Kalkhar road is based on the findings of ESIA (Environmental and social Impact Assessment) carried out in the project corridor and provides for effective implementation of the Environment & Social Management measures required for addressing the potential environmental & Social impacts/risks. This Environment & Social Management Plan assists HPRIDCL and the Contractor to implement the environmental & Social management measures effectively.



## 2. LEGAL AND REGULATORY FRAMEWORK

9. A review of the legal and regulatory framework related to the environmental and social safeguards and their applicability to the project road has been made covering the following and included under Section 3 of ESIA Volume:

- Applicable Regulations of GoI/ GoHP
- World Bank ESF Policy, WBG's EHSs and Standards – Extent of Relevance
- Comparison of GoI/ GoHP legislations and ESF, 2016

10. The ESIA volume may be referred for any further details on the applicable legal and regulatory framework for the project road.

### 2.1 Clearances and Permissions required for Project Road

11. The project road does not require any prior environmental or forest clearances from the State Government or Government of India level. The pre-construction and construction stage permissions required for the project road are given in **Table 2-1**.

**Table 2-1: Clearances and Permissions Required for Project Road**

S. No.	Clearances/Permissions required	Competent Authority to Accord Clearances	Responsibility to Obtain Clearance
<b>A. Pre-construction Stage</b>			
1	Permission for felling of an estimated 360 trees, which are within the Right of Way (RoW)/ Corridor of Impact (CoI)	Divisional Forest officer, Mandi, Department of Forests, GoHP and District Magistrate Mandi	HPRIDCL
<b>B. Construction Stage</b>			
1	Consent to establish and Consent to operate construction camp sites, crusher units, hot mix plants, concrete batch mix plants, WMM plants, work force camps etc.	Himachal Pradesh State Pollution Control Board	Contractor
2	Permissions for sourcing of water for construction activities (Surface and Ground Water)	HP Ground Water Authority and Irrigation and Public Health Department, GoHP	Contractor
3	License to store HSD and Explosives at Construction camp, if required.	Regional office of Chief Controller of Explosives, GoI, Himachal Pradesh	Contractor
4	Permission to Establish Construction camps	District Magistrate & Local Panchayat (s), landowners in case of private land	Contractor
5	Opening of new quarry sites for Stone aggregates	Geological Wing, Department of Industries, GoHP	Contractor
6	Labour licence/ permits for engaging construction workers (skilled & un-skilled)	Respective district level Labour Officer	Contractor

### 3. ENVIRONMENTAL AND SOCIAL RISKS AND MITIGATION MEASURES

#### 3.1 Summary of Risk/Impacts

12. Identification of Environmental and social Risks/Impacts was carried during ESIA process is summarized as follows in **Table 3-1**.

**Table 3-1: Environmental and Social Risks/Impacts**

Components	Environmental and social Risks	Risk Type
<b>Construction Phase</b>		
Topography & Geology	<ul style="list-style-type: none"> <li>Change in existing profile of the land due to earthwork and rock excavation.</li> <li>Disturbance on geological setting due to hill side cutting/quarrying resulting in the accumulation of debris material.</li> </ul>	Low risk
Soil	<ul style="list-style-type: none"> <li>Loosening of topsoil &amp; loss of vegetative cover along the road due to excavation and back filling which will lead to enhanced soil erosion.</li> </ul>	Low risk
Land Use	<ul style="list-style-type: none"> <li>Generation of debris waste in the form of excavated material/construction spoils from construction sites.</li> <li>Changes in existing land use pattern of the ROW for construction of the road.</li> <li>Roadside agricultural land will be affected by unauthorised debris disposal.</li> </ul>	Moderate risk
Drainage	<ul style="list-style-type: none"> <li>Chances of filling of existing drainage courses during earth filling.</li> <li>Scouring of land in the outfall locations of culverts.</li> </ul>	Moderate risk
Water Use	<ul style="list-style-type: none"> <li>Impact on the local water sources due to its usage as construction water.</li> </ul>	Low risk
Water Quality	<ul style="list-style-type: none"> <li>Increase of sediment load in the runoff from construction sites and increase in turbidity in receiving streams/water bodies.</li> <li>Water pollution due to sewage from construction camps.</li> </ul>	Moderate risk
Air Quality	<ul style="list-style-type: none"> <li>Deterioration of air quality due to fugitive dust emission from construction activities like excavation, backfilling &amp; concreting, hauling &amp; dumping of earth materials &amp; construction spoils, and vehicular movement along unpaved roads.</li> <li>Deterioration of air quality due to gaseous emissions from construction activities.</li> </ul>	Moderate risk
Noise Level	<ul style="list-style-type: none"> <li>Increase in noise level due to construction activities like operation of construction equipment and vehicular traffic.</li> </ul>	Moderate risk
Flora and Fauna	<ul style="list-style-type: none"> <li>Loss of flora &amp; loss of habitat of fauna due to felling of trees along the ROW.</li> </ul>	Low risk
Construction Camp	<ul style="list-style-type: none"> <li>Influx of construction work force and supplier who are likely to construct temporary sheds in the vicinity.</li> <li>Likely sanitation and health hazards &amp; other impacts on the surrounding environment due to inflow of construction labourers.</li> <li>Health risks due to lack of health and sanitation conditions through disposal of sewage on open land which may cause mosquito nuisance, water borne diseases etc. Chances of spread of sexually transmittable diseases like AIDs.</li> </ul>	Moderate risk
Occupational Health & Safety	<ul style="list-style-type: none"> <li>Health &amp; safety related problems to construction workers due to inadequate health &amp; safety measures.</li> </ul>	Moderate risk

Components	Environmental and social Risks	Risk Type
Road Safety	<ul style="list-style-type: none"> <li>Increase on incidence of road accidents due to disruptions caused in existing traffic movements.</li> </ul>	Moderate risk
Land Acquisition	<ul style="list-style-type: none"> <li>Design Measures suggests that there is no land acquisition from private parties</li> </ul>	Low Risk
Private structures	<ul style="list-style-type: none"> <li>Encroachment of structures will be adequately compensated as per RAP. A RAP will be prepared to mitigate the measures. No displacement will take place due to removal of structures; the impacts are partial.</li> </ul>	Moderate risk
<b>Operational Phase</b>		
Land Use & Encroachment	<ul style="list-style-type: none"> <li>Change of land use by squatter/ encroachment within ROW and induced development outside the ROW.</li> <li>New spaces generated due to shift in alignment could be encroached by local people or other people.</li> </ul>	Moderate risk
Drainage	<ul style="list-style-type: none"> <li>Environment degradation is due to improper maintenance of drainage.</li> </ul>	Moderate risk
Air Quality	<ul style="list-style-type: none"> <li>Air pollution due to vehicular emission from road traffic.</li> </ul>	Low risk
Noise Level	<ul style="list-style-type: none"> <li>Noise pollution due to increased traffic.</li> </ul>	Low risk
Access	<ul style="list-style-type: none"> <li>Significant severance problem on pedestrian &amp; animal crossing and cross traffic due to widening, partially access control &amp; increase in traffic speed.</li> </ul>	Low risk
Road Safety	<ul style="list-style-type: none"> <li>Impacts on human health due to accidents.</li> <li>Damage of road due to wear and tear.</li> </ul>	Low risk

### 3.2 Natural Disasters/ Calamity and Hazard Vulnerability - Climate Change Risks

13. The overall ‘Vulnerability’ status of the Mandi district, within which the project road traverses is “High” in terms of landslides, earthquake, wind, cloudburst occurrences and floods as categorized by the Himachal Pradesh Disaster Management Authority, GoHP (for more details ref. 4.7 under Section 4 - Baseline Data of ESIA Volume).

14. Given that the project road and the entire Mandi district is in Zone V, which is a high-risk earthquake zone and the presence of potential mud slip/land slide locations along project road, construction work poses risk and safety hazard to workforce and community, in the event of natural disasters like earthquakes and/or mud slip/landslides which may get triggered due to earthquake tremors or due to high intensity rainfall and/or cloudbursts. Any such occurrences may strand the workforce or even worse, they may get trapped at project construction and establishment camp sites.

15. The probability of seasonal hazards of along project road as well as Mandi district based on the Mandi District Disaster Management Plan is given in **Table 3-2**.

**Table 3-2: Probability of Seasonal Hazards of Mandi District**

Hazard	Probable Months											
	Jan	Feb	Mar	April	May	June	July	August	Sept	Oct	Nov	Dec
Flood												
Forest Fire												
Drought												
Earthquake												

Hazard	Probable Months											
	Jan	Feb	Mar	April	May	June	July	August	Sept	Oct	Nov	Dec
Cold Event												
Heat wave												
Hailstorm												
High Winds												
Road accident												

### Management/Mitigation Measures

16. The Environmental and Social Risks due to such natural disasters can be managed/mitigated through a Disaster Management & Emergency Response Plan (ERP) at project road construction level, which shall further be in tandem with the Disaster Management and Relief Mechanism by the designated authorities/institutions at District/State level.

17. The ERP at project road construction level in an event of climate change induced natural disasters and/or any other natural calamities shall comprise the following:

- In order to ensure the safety of work force at operational sites and safe evacuation of workforce in the event of natural disaster and/or any other natural calamities, the project road construction contractor shall have an emergency response plan (ERP).
- As part of the ERP, the project contractor shall establish and maintain regular coordination with the designated officers for Disaster Management at district/sub-division levels. Maintaining regular coordination will enable to seek quick response, in the event of natural disaster and/or any other natural calamity.
- Mandi district has a Disaster Management Plan at district and subdivision level, which provide the institutional arrangements, designated officers, emergency response systems, infrastructure facilities like hospitals, fire stations, police station at tehsil, sub-division and village levels.
- All project operations shall be planned and coordinated in tandem with the daily/weekly weather predictions/alerts issued by competent authorities as relevant for the district/ project road and all such alerts shall be duly considered and review the scheduled work programs on a daily basis.
- At project level, contractor shall designate an Incident Controller (IC), Emergency Controller (EC), Assembly Coordinator (AC) and other required personnel for the emergency response mechanism in an event of natural disaster/ calamity in line with the ERP.
- The preparation and implementation of ERP shall form a part of C-ESMP of the contractor and checked and approved by the CSC. A template for the Climate Change Disaster Management and Emergency Response Plan at the level of project road construction for contractor's guidance is given in **Appendix<sup>1</sup>-17**, which can be further updated suiting to requirements of contractor's scale of establishment after the mobilization.
- All work force irrespective of levels are to be provided with training and periodic mock drills to ensure the preparedness for any emergency situations, always in short notice.
- The local community along project road shall also be engaged in mock drills for proactive participation in case of any natural hazards or disaster/ calamity.

<sup>1</sup> Included as an Appendix in ESIA Volume but reproduced in the standalone ESMP volume for ready reference.

18. The preparation and implementation of ERP is included as part of the mandatory contractual obligation of the contractor's ESMP (C-ESMP) (ref. Sl. No. 5 under Table 4-1, Section 4).

### **3.3 Work Zone Safety and Community Safety Risks**

19. The project road construction works will have potential work zone safety for workforce as well as community safety risks, which can be summarized as hereunder:

- i. Safety issues for both workforce as well as community due to mud slips or localized landslides during excavation operations for road widening and construction of protection works such as breast walls, toe walls and retaining walls
- ii. Cracks or minor damages to the structures adjacent to the right of way due to the use of heavy construction machineries, which may have potential to induce vibrations, particularly during site clearance operations, excavation, and paving operations
- iii. Safety issues for both workforce as well as community due to movement of rotating construction equipment, vehicles deployed for hauling of materials and debris disposals etc.
- iv. Community health concerns due to increased/ direct exposure to high noise levels of construction machineries, particularly along settlement areas with limited carriageway/roadway width, particularly at sensitive receptor locations such as schools, religious places, health centers/hospitals etc.
- v. Increased levels of dust and vehicle emissions due to construction activities, movement of construction vehicles, induced traffic congestion and idling of vehicles due to ongoing construction works
- vi. influx of migrant workers could potentially cause discomfort or potential conflicts with local community particularly at marketplaces.

#### **Management/Mitigation measures**

20. Prior to commencement of construction, the contractor will prepare and submit Contractor's ESMP (C-ESMP), which will include contractor's management plan to comply with the project's safeguard requirements and Management Strategies and Implementation Plans (MSIPs) for (i) Work Management; (ii) traffic and work zone safety management plan for the prioritized encumbrance free stretches, in accordance with approved implementation schedule. In addition, the contractor will be contractually obligated to implement work zone safety arrangements conforming to the requirements of IRC: 67 and IRC: SP: 55: 2014, which include provision of PPEs, fixed/ mobile barricades between work area and pedestrian/ traffic and required measures for ensuring community safety during construction activities. The requirements also include site specific traffic management plan for all types of works along with work zone safety check list. A typical diagram showing traffic management during construction phase as shown in **Figure 3-1** and an illustrative checklist for work zone safety is given in **Appendix-18**.

21. The responsibility of contractor to manage these risks will be clearly reflected in the contractual obligations of the Civil Works Contractor with appropriate mechanisms for addressing non-compliance. The bid documents for construction will incorporate requirements for Environment, Social, Health and Safety (ESHS) including list of applicable labor laws and community safety provisions for periodic reporting by contractors. Commencement of any activity by contractor without prior approval of these requirements will be treated as "fundamental breach of contract".

22. The C-ESMP will be approved by the CSC, prior to the commencement of construction activities, will be periodically reviewed by CSC (but not later than every 3 months) and updated in a timely manner by the Contractor, to ensure that it contains appropriate measures for the work zone and community safety throughout construction phase.

23. The preparation and implementation of work zone safety requirements is included as part of the mandatory contractual obligation of the contractor's ESMP (C-ESMP) (ref. Sl. No. 6 under Table 4-1, Section 4).



Figure 3-1: Typical Traffic Management & Work Zone Safety Arrangements

### 3.4 Road Safety Measures

24. The built-up and settlement areas have direct access on to project road in addition to intersections like major and minor junctions. The road will also act as haul road for transporting construction materials and debris, along with concurrently ongoing construction activities at prioritized stretches. Adding to these, existing site settings i.e., present narrow roadway width, sharp curves, hilly/mountainous terrain will provide limited option for maneuvering. All of these is likely to cause restrictions/inconveniences and safety issues to existing road users, requiring temporary traffic diversions, traffic management through warden/monitor(s) with reflective jackets and handheld batons and appropriate traffic signages in addition to dust suppression and noise level management measures, among others.

25. To ensure ease of traffic movement as well as community safety (local people as well throughfare road users) along the road will largely depend on contractor's work management plan and procedures, which will be regulated through contractual obligations. In addition, road safety measures like provision of information/caution boards, road signages, object markers will be provided at all required locations in accordance with IRC:99-2019 as per the road safety plan for the project road and are summarized in **Table 3-3**.

Table 3-3: Road Safety Signages proposed to Project Road

Sl. No.	Description	Location/ Usage	Unit	Quantities
<b>A</b>	<b>Informatory signs</b>			
	(a) Facility information signs of size 800mm x 600mm	Bus stops & Hospitals	Nos	23
	(b) Direction/ place identification signs of 1200mm x 600mm	Settlements and Minor Junctions	Nos	47
	(c) Advance Direction/ destination/ reassurance/ place identification signs of 1200mm x 750mm	Minor Junc. -4 legged & Major Junc.-3 Legged	Nos	4

Sl. No.	Description	Location/ Usage	Unit	Quantities
	(d) Advance direction/ destination/ reassurance/ place identification signs of 1200mm x 1150mm	Major Junc.-4 legged	Nos	2
	(e) Route marker signs of rectangular plate of 450mm x 600mm	Major Junction with SH/ NH	Nos	3
<b>B</b>	<b>Cautionary signs</b>			
	(a) Cautionary signs of size 600mm (triangular)	School zone, junctions and curvatures	Nos	273
	(b) Chevron boards – single chevrons of 500 x 548 (WXH in mm) Single sign post with TWO chevron boards	Curvatures	Nos	310
<b>C</b>	<b>Mandatory signs</b>			
	(a) Circular of size 600mm	Speed restricted zones & Curvatures	Nos	164
	(b) Octagonal of size 750mm	Junctions	Nos	15
D	Object marker (hazardous)	Bridges & Culverts	Nos	571
E	Convex mirrors	Hairpin bends/ Blind curves	Nos	8
F	Road studs RED-WHITE Bi-directional	Blind curves, Hairpin bends & Built-up locations	Nos	3959
G	Road studs Yellow Bi-directional	Blind curves, Hairpin bends & Built-up locations	Nos	3959
H	Rumble strip markings	Blind curves, Hairpin bends, School zone and junctions	sqm	495
I	Pedestrian crossing – markings	School zones & Bus stops	sqm	308
J	Retro refracting tape for crash barrier	Along the crash barriers	m	12650
K	AFC sheets for hazards or fixed hazards	Along the road side structures	m	400
L	Gantry boards	At end point of the road	No	2

### 3.5 Provision for Nature Based Bio Engineering Interventions

26. The landslide impact can be further minimized / mitigated through provision of engineering and non-engineering interventions. Some of engineering measures considered for the project road are breast walls along hill side and retaining walls along valley side in order to protect the vulnerable and potential landslide locations due to hill cut and filling of valley side for project road construction.

27. The landslide impact can be further minimized / mitigated through provision of non-engineering and nature-based bio engineering interventions. Potential locations for nature-based bio-engineering intervention requirements assessed for the project road during ESIA is given in **Table 3-4**. However, these locations will have to re-assessed/reviewed along with additional warranted locations for bio- engineering interventions once the hill cut operations along hill side and filling works along valley side are completed during construction phase.

**Table 3-4: Potential Locations for Bio Engineering interventions along Project Road**

S. No.	Chainage	Bio-engineering Intervention	LHS/RHS	Length RM	Slope length (m)	Slope angle°
1	1+760	Hedge Brush Layer, Grass Slip Plantation	LHS/HS	25	8	50°
2	1+960	Hydroseeding	RHS/HS	300	6	>60°
3	2+580	Hedge Brush Layer, Grass Slip Plantation	RHS/HS	420	8	55°
4	3+350	Grass Slip Plantation	RHS/HS	8	8	45°
5	3+350	Grass Slip Plantation	LHS/VS	8	8	45°
6	3+490 to 3+800	Brush Layer, Grass Slip Plantation and Bamboo Crib Wall	RHS/HS	310	8	45°
7	5+480 to 5+530	Brush Layer, Grass Slip Plantation and Bamboo Crib Wall	LHS/HS	50	8	45°
8	5+480	Brush Layer, Grass Slip Plantation and Bamboo Crib Wall	RHS/VS	20	15	45°
9	9+430 to 9+460	Brush Layer, Grass Slip Plantation and Bamboo Crib Wall	RHS/HS	30	8	45°
10	10+200 to 11+200	Brush Layer, Grass Slip Plantation	RHS/HS	1,000	6	45°
11	12+200 to 12+800	Grass Slip Plantation, Shrub plantation	RHS	600	8	45°
12	12+200 to 12+800	Grass Slip Plantation, Shrub plantation	LHS	600	8	45°
13	23+960 to 24+940	Grass Slip Plantation	LHS	80	8	45°
14	0+000 to 28+000	25% of total length: Brush layer 2 layers, Grass seed sowing,	VS	28,000	5	45°
15	0+000 to 28+000	25% of total length: Brush layer 2 layers, Grass seed sowing,	HS	28,000	4	45°
16	0+000 to 28+000	Palisade 1% of total Brush layer	-	28,000	-	-
17	0+000 to 28+000	Fascine 4% of total Brush layer	-	28,000	-	-

28. Most suitable provisions made for the nature based (bio-engineering) interventions considered in the project design are given in **Table 3-5** and cover potential landslide and erosion prone stretches along the RoW, upstream and downstream of seasonal streams, CD structures, muck/debris disposal sites, low-lying areas reclaimed /open areas in RoW, areas of cleared of invasive vegetation among others.

29. Adequate cost provisions have been included in the project cost estimates for both engineering and non-engineering interventions to avoid impacts due to landslides, erosion and enhance vegetative cover along project road. The bio-engineering works are to be executed in accordance with the detailed specifications of Bio-Engineering manual of HPPWD under the supervision of bio-engineering specialist of HPRIDCL.



**Table 3-5: Bio-Engineering Interventions for Slope Stability and Erosion Control**

S. No	Description	Unit	Quantity
i	Construction of hedge brush layer	RM	39500
ii	Construction of brush layer	RM	38530
iii	Construction of live palisade	RM	1430
iv	Construction of live Fascine	RM	2760
v	Grass slip plantation on slope <45° @ 100 drills/sqm	sqm	8630
vi	Grass slip plantation on slope 45°-60° @ 100 drills/sqm	sqm	3200
vii	Grass slip plantation on >60° slope @ 100 drills/sqm	sqm	1260
viii	Plantation of large sized stature grass slips at slope of <45° @ 20 slips/sqm	sqm	7560
ix	Bamboo crib wall	cum	1460
x	Tree plantation in plains within RoW	nos	3200
xi	Shrub Plantation in plains Within Row	Nos.	1450
xii	Agave plantation in slopes	nos	200
xiii	Group plantation of shrubs	sqm	200
xiv	Hedge Plantation (2 plants/RM)	RM	500
xv	Hedge Plantation (4 plants/RM)	RM	500
xvi	Bamboo plantation within RoW	nos	500
xvii	Grass seed sowing at >40° slopes including vetiver	sqm	31200
xviii	Grass seed sowing <40° slopes	sqm	31550
xix	Grass seed sowing on slope 40-45° with mulch and jute netting	sqm	28650
xx	Hydro seeding including dressing/trimming of slope including removing of fractured material and maintenance with watering 2 to 3 times after 12hrs of hydro seeding @ 1 litre/Sqm (each time) for six months/propagation of grasses and shrubs under supervision of hydro seeding provider	sqm	35650

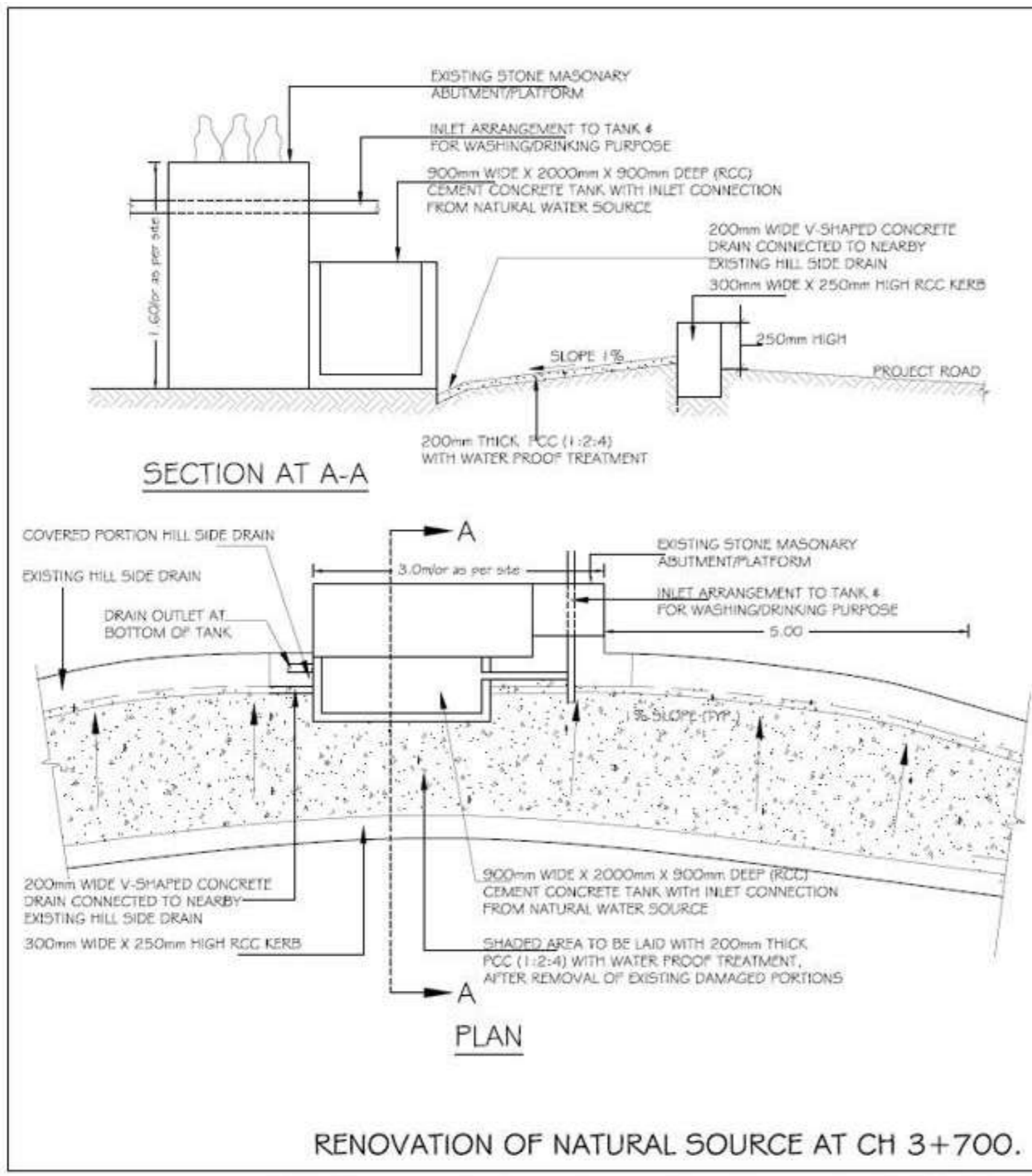
### 3.6 Site Specific Environmental Enhancement/ Conservation Measures

30. As part of the Environmental and Social Impact Assessment, consultations were held along project road at various locations. Based on the outcome of the consultations and site investigations, some location specific management or enhancement measures have been considered for natural water sources and religious shrines/structures (Peepal tree with platform) for conservation of natural resources and cultural heritage measures. The list of such locations is given in **Table 3-6** and the drawings showing conservation or enhancement measures for these structures/locations are given in **Figures 3-2 to 3-20**. Adequate cost provisions have been included in ESMP budgetary provisions and placed at the end this report.

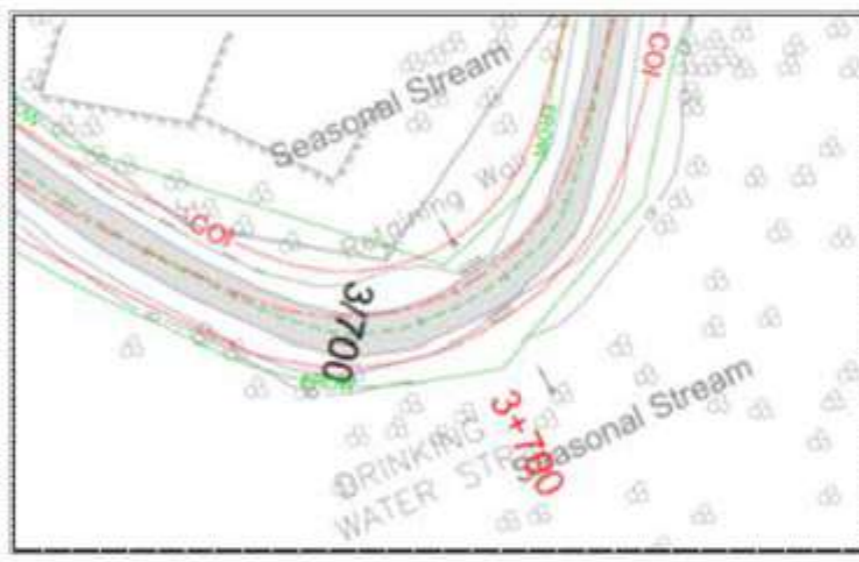
**Table 3-6: Structures considered for Conservation/Renovation and Enhancement Measures**

Sl. No.	Chainage	Type of CPR Structure and Conservation/ Renovation & Enhancement Measure considered	Reference Drawing Number
1	3+700	Natural Water Source – Conservation & Enhancement Measure	Figure 3-2
2	3+999	Religious Shrine – Renovation	Figure 3-3
3	4+297	Dug well – Conservation & Enhancement Measure	Figure 3-4
4	4+515	Primary health Centre – Provision of Crash Barrier	Figure 3-5
5	4+773	Private School – Provision of Noise Barrier* see note below	Figure 3-6
6	5+321	Religious Shrine/structure (Peepal tree with platform)– Renovation and Enhancement Measure	Figure 3-7
7	5+989	Religious Shrine - Relocation & Enhancement Measure	Figure 3-8
8	8+275	Religious Shrine/structure (Peepal tree with platform)– Conservation & Enhancement Measure	Figure 3-9
9	8+280	Natural drinking resource– Conservation & Enhancement Measure	Figure 3-10
10	10+416	Natural water resource – Conservation & Enhancement Measure	Figure 3-11
11	10+725	Religious Shrine – Conservation & Enhancement Measure	Figure 3-12
12	12+482	Natural water resource – Conservation & Enhancement Measure	Figure 3-13
13	18+048	Natural drinking water resource (all season)– Renovation & Enhancement Measure	Figure 3-14
14	22+545	School – Provision of Noise Barrier* see note below	Figure 3-15
15	22+997	Religious Shrine/structure (Peepal tree with platform) – Resizing & Enhancement Measure	Figure 3-16
16	24+218	Religious Shrine/Structure – Relocation & Enhancement Measure	Figure 3-17
17	24+734	Peepal tree and shrine platform – Conservation & Enhancement Measure	Figure 3-18
18	28+216	Small Temple (Lakhdata Peer)– Relocation and Enhancement Measure	Figure 3-19
19	28+415	Religious Shrine/structure (Peepal tree with platform)– Renovation and Enhancement Measure	Figure 3-20

*Note- Provision of polycarbonate noise barrier outside the school building has been discussed with the school authority during the Stakeholder consultation as part of ESIA. However, alternative materials or types for noise barrier like use of double-glazed windows for the school building can also be evaluated during the project implementation phase, in consultation with the school authorities, which may require to replace or retrofit all the windows with double glazed shutters.*



RENOVATION OF NATURAL SOURCE AT CH 3+700.



LOCATION PLAN



PRESENT SITE PHOTOGRAPH AT CH 3+700

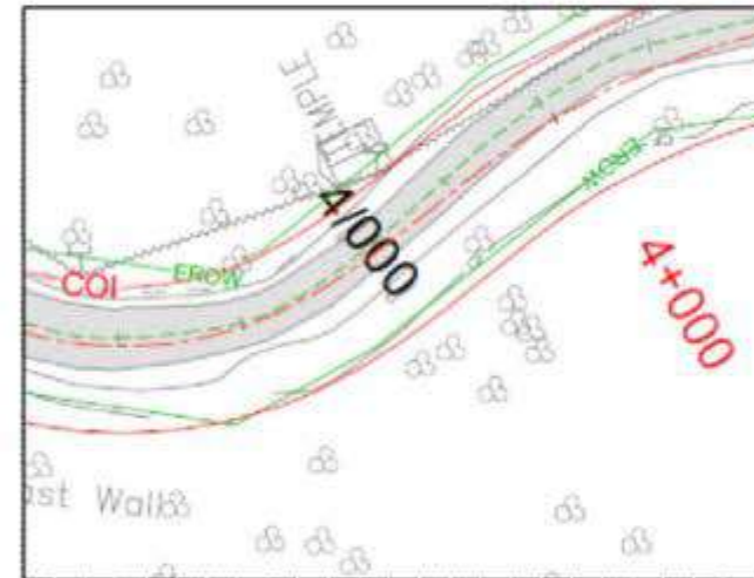
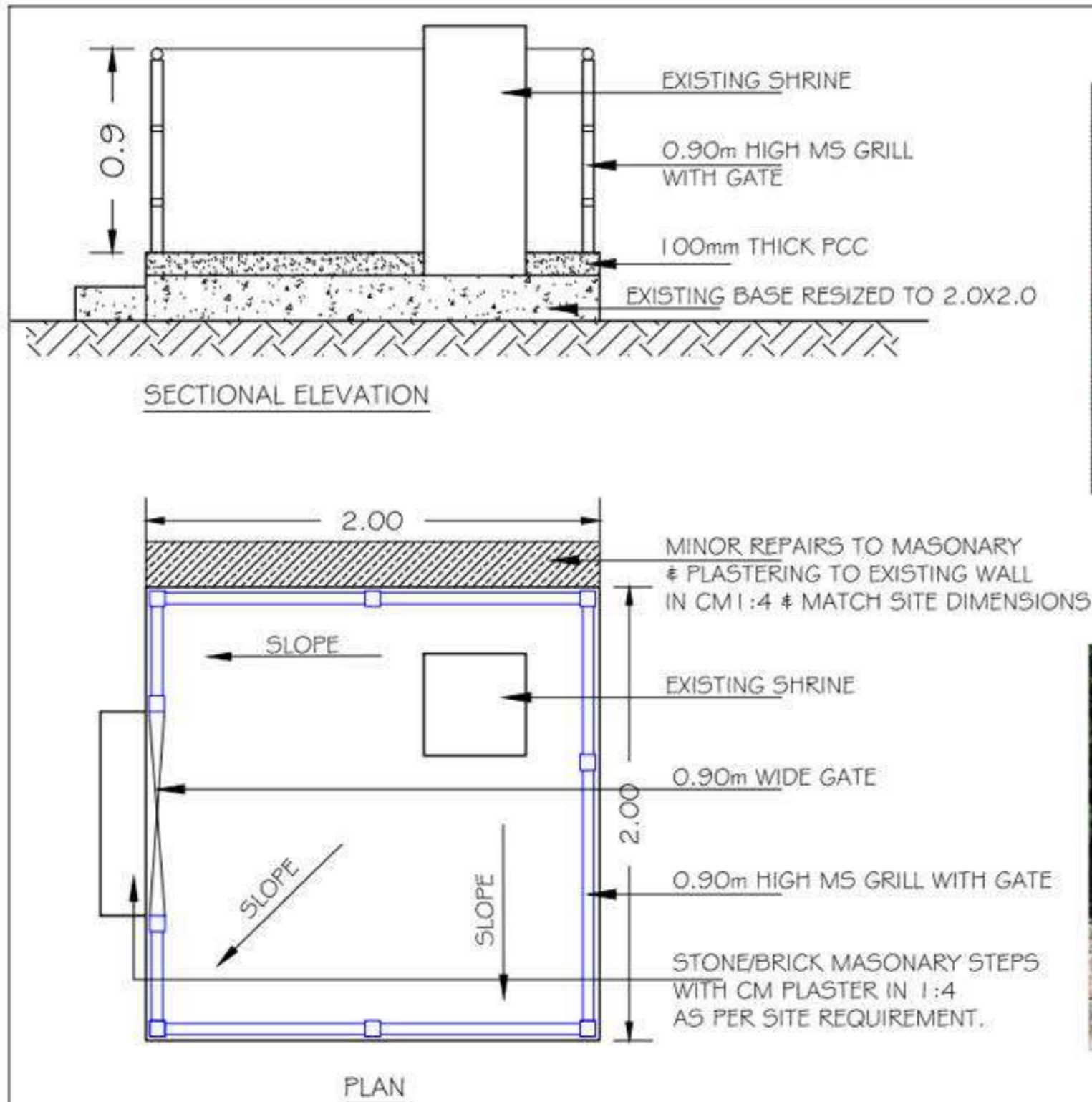
**Items for Renovation of Natural Water Source cum open well at Ch 3+700**

1. Carryout minor repairs to the entire masonry of superstructure/masonry block of natural water including filling up cracks and redoing broken edges and sides as required /per site condition and all sides of super structure is finished to slope outwards to avoid stagnation of water around the well
2. Provide 300 mm thick PCC 1:2:4 and a 200 mm deep V shaped drain as per indicated areas in the drawing at water source structure with proper slopes and a RCC kerb along the edge of the road as shown in the drawing to avoid stagnation of water surrounding the water source and spill over of water from source on to the road.
3. Providing cement 12 mm thick plastering in CM 1:4 to all external surfaces of the water source/ well super structure with a neat coat of cement finish
4. Providing two coats of exterior paint/white washing to the entire super structure of source as per site requirements
5. Replace all pipe extensions and plumbing fixtures at water source as well as provide proper inlet connections to all water troughs to facilitate drinking of water by stary animals, grazing cattle as well as for washing of vehicles by road users
6. Removal and/or clearing of unwanted debris/wate material surrounding the water source/ well and disposal of the same at an approved location
7. "3M" make high intensity retro reflective conspicuity tape (2" wide X 1mtr length) shall be pasted along edge of road near structure

Note: All renovation /conservation work shall be carried out in close consultation with local community leaders/regular users of at the water source. All suggestions shall be duly considered with prior approval of Engineer-in-Charge.

Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-2: Renovation of Natural Source at Ch. 3+700



**Items for Renovation of Religious Shrine at Ch 3+999**

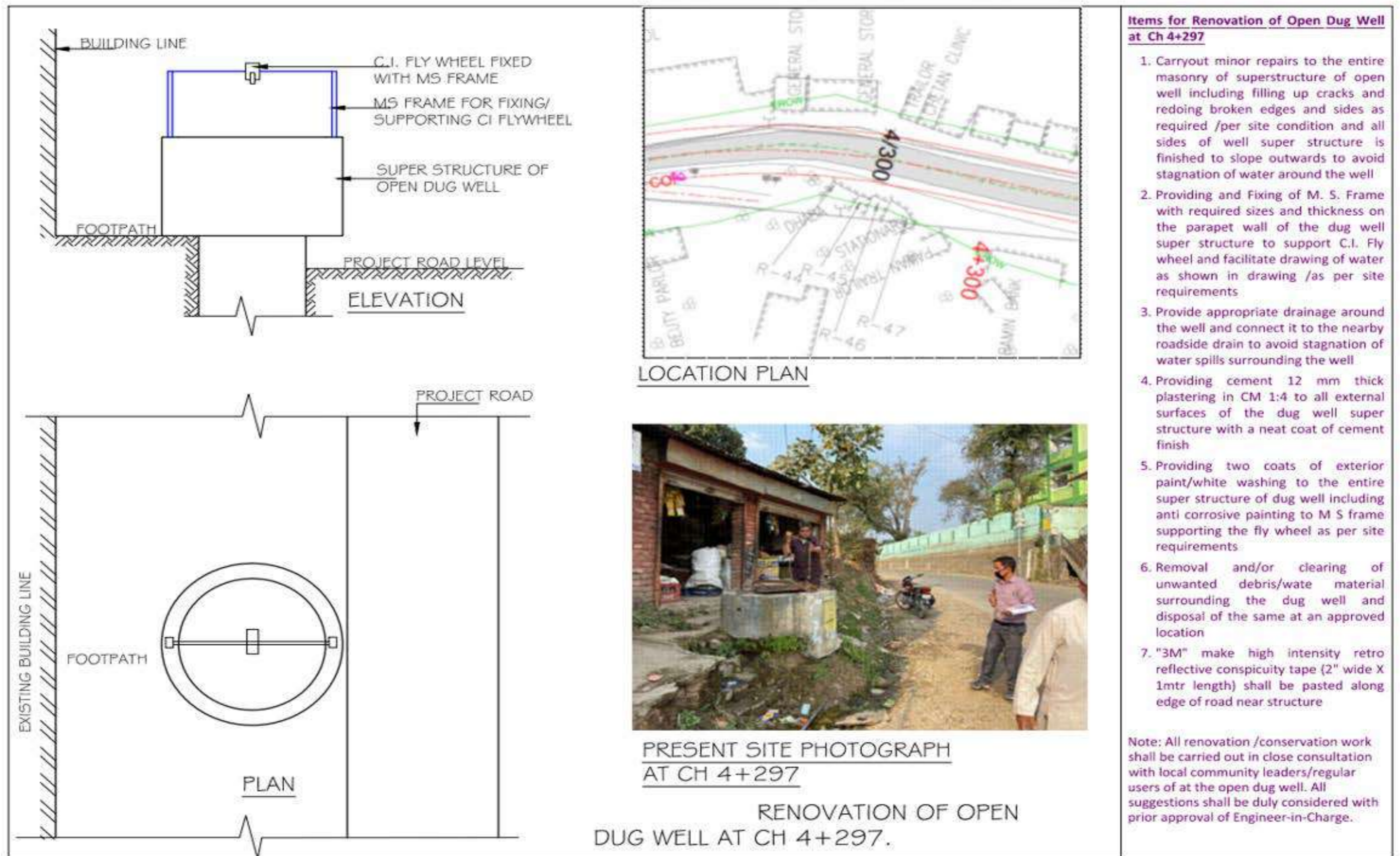
1. Carryout repairs to random rubble masonry wall in CM 1:4 to retain earth at the back side of shrine and plaster the masonry wall in CM 1:4 with 12mm thick. The dimension of structure shall be 2-metre-long, 1.5 metre height and shall vary and match as per site conditions.
2. Resize the existing base of the shrine to 2m X 2m and lay a 100mm thick PCC 1:2:4 bed, sloping outwards as shown in drawings and as per site conditions
3. Providing and Fixing of MS railing all along the edge of the newly built platform (900 mm height and 8metre long) with a gate for entrance/exit.
4. Provide one or two steps in rubble masonry and plaster the same in CM 1:4 and 12mm thick as per site requirements for easy entry and exit of visitors
5. Provide two coats of exterior paint/white washing to the entire religious shrine as per site conditions/site requirements
6. Removal and/or clearing of unwanted debris/wate material surrounding the shrine and disposal of the same at an approved location
7. "3M" make high intensity retro reflective conspicuity tape (2" wide X 1mtr length) shall be pasted along edge of road near structure

Note: All renovation /conservation work at the religious shrine shall be carried out in close consultation with local community leaders/regular users of shrine. All suggestions shall be duly considered with prior approval of Engineer-in-Charge.

**RENOVATION OF RELIGIOUS SHRINE AT CH.3+999.**

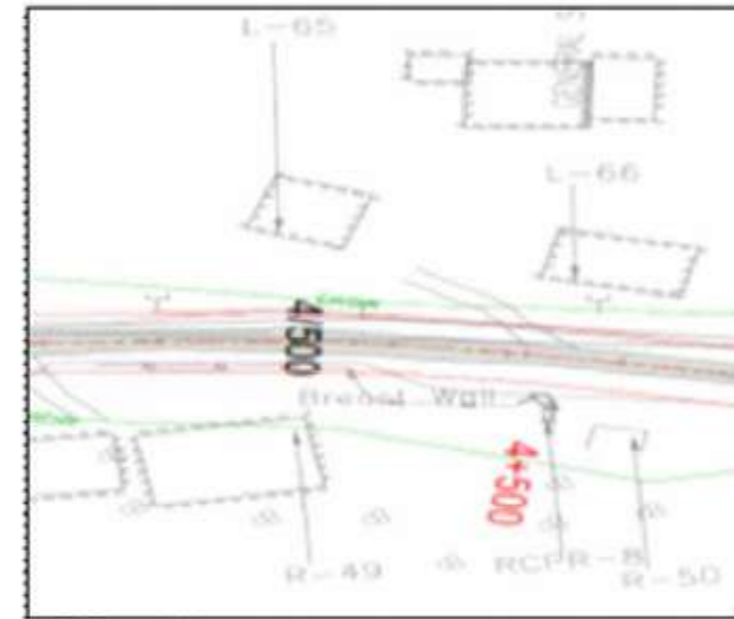
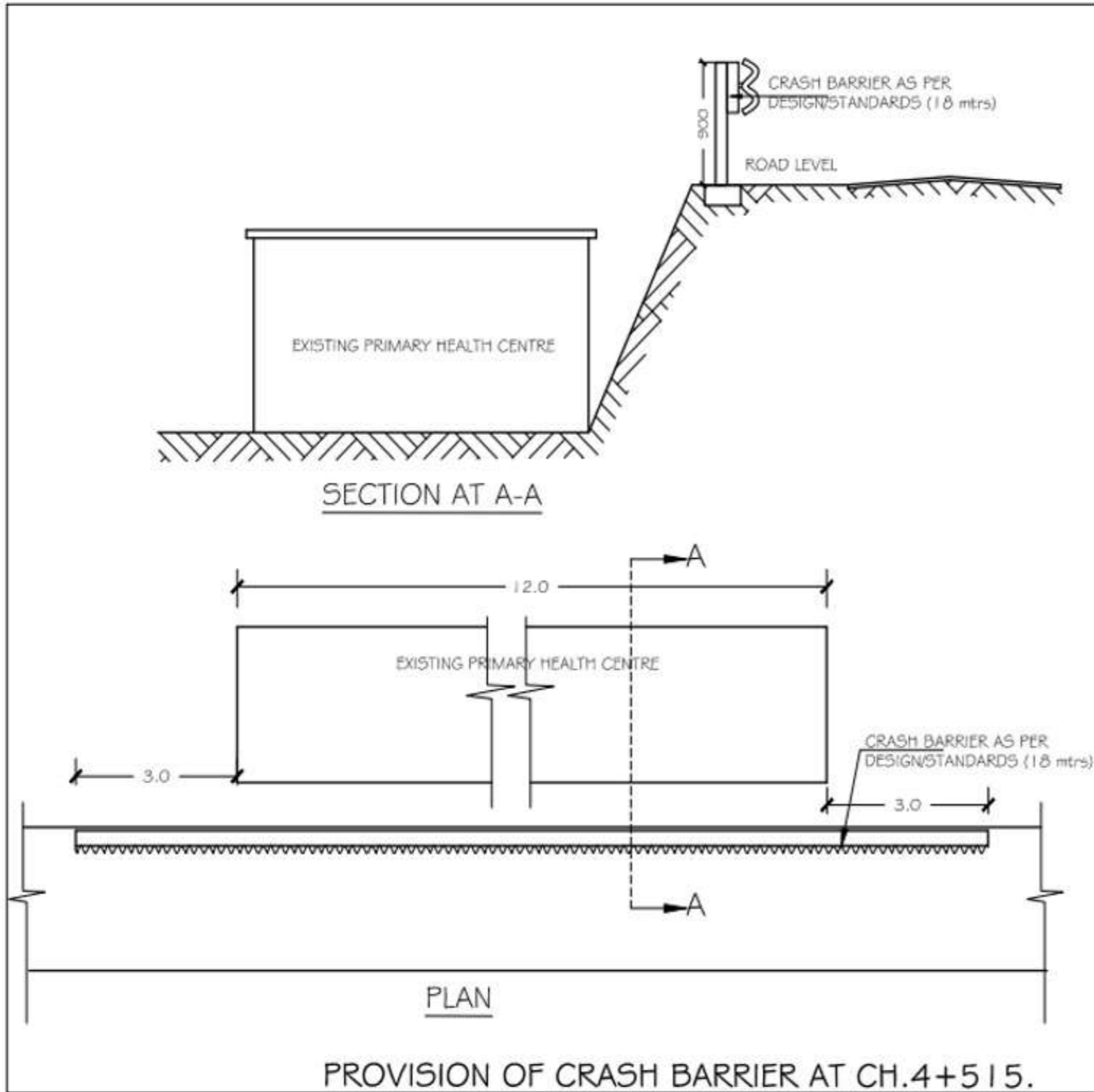
Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-3: Renovation of Religious Shrine at Ch. 3+999



Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-4: Renovation of Open Dug Well at Ch. 4+297



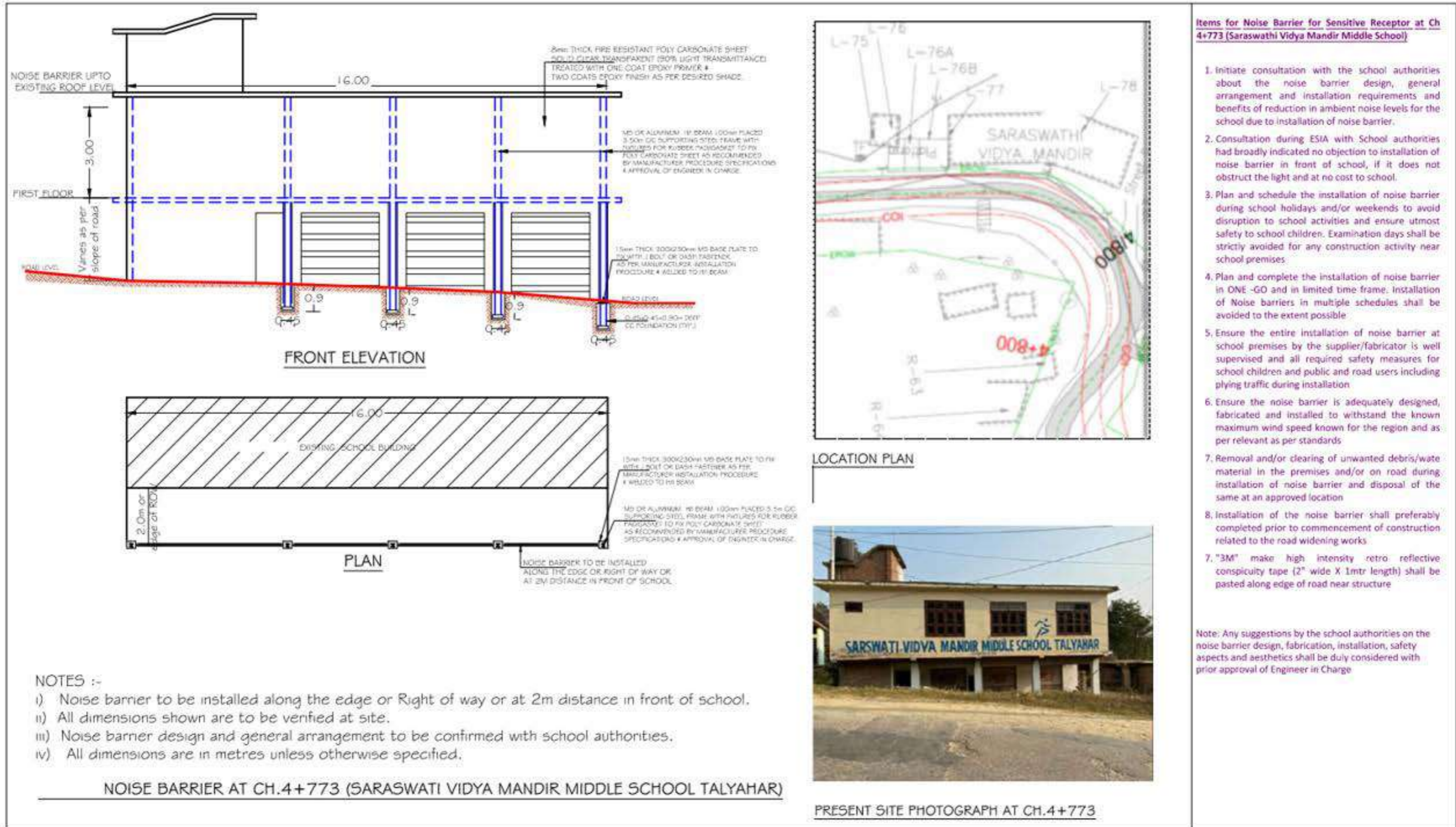
**Items for Safety Enhancement of Sensitive Receptor (primary health centre) at Ch 4+515**

1. Provide crash barrier for the entire length of the sensitive receptor with atleast 3m additional length on both side of the sensitive receptor
2. The crash barrier shall be as per standard specifications
3. Removal and/or clearing of unwanted debris/wate material along the road side and back side of the sensitive receptor and disposal of the same at an approved location
7. "3M" make high intensity retro reflective conspicuity tape (2" wide X 1mtr length) shall be pasted along edge of road near structure

Note: The primary health centre shall be consulted during the installation of crash barrier and suggestions received from health centre shall be duly considered with prior approval of Engineer-in-Charge.

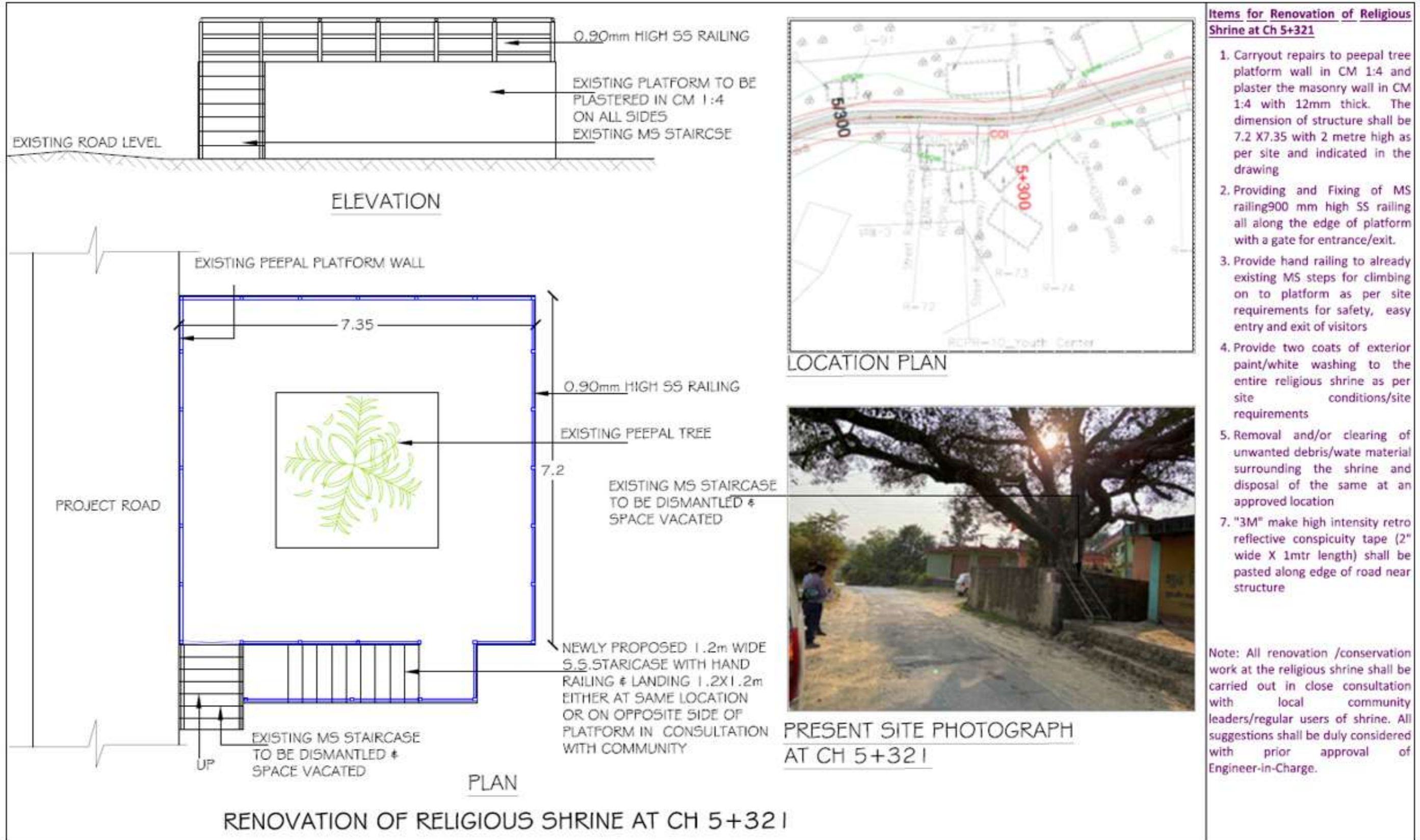
Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-5: Provision of Crash Barrier at Ch. 4+515



Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-6: Noise Barrier (Saraswati Vidya Mandir School Talyahar) at Ch. 4+773



Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

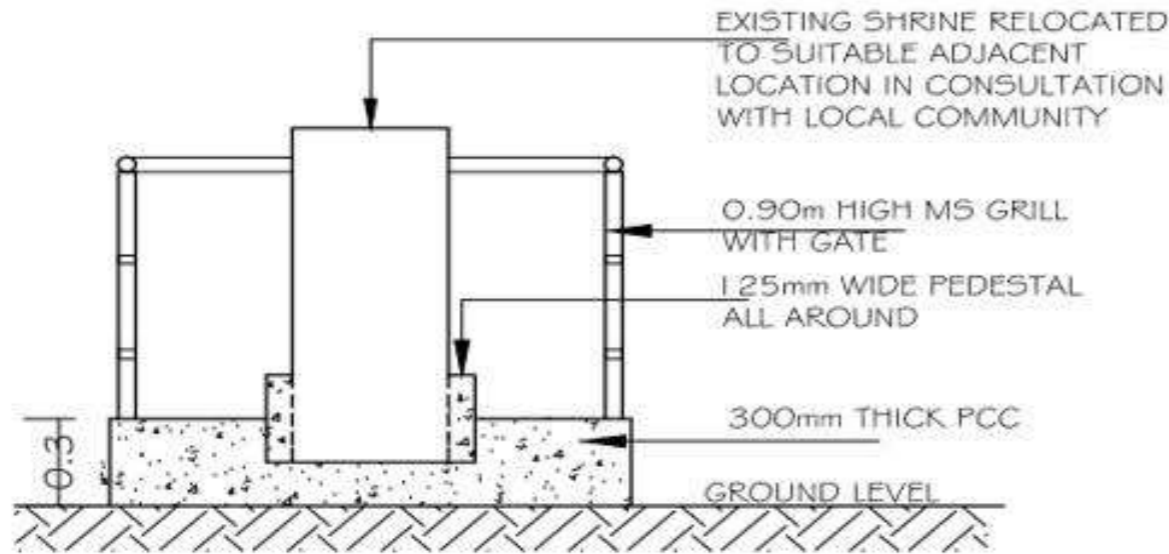
Figure 3-7: Renovation of Religious Shrine at Ch. 5+321



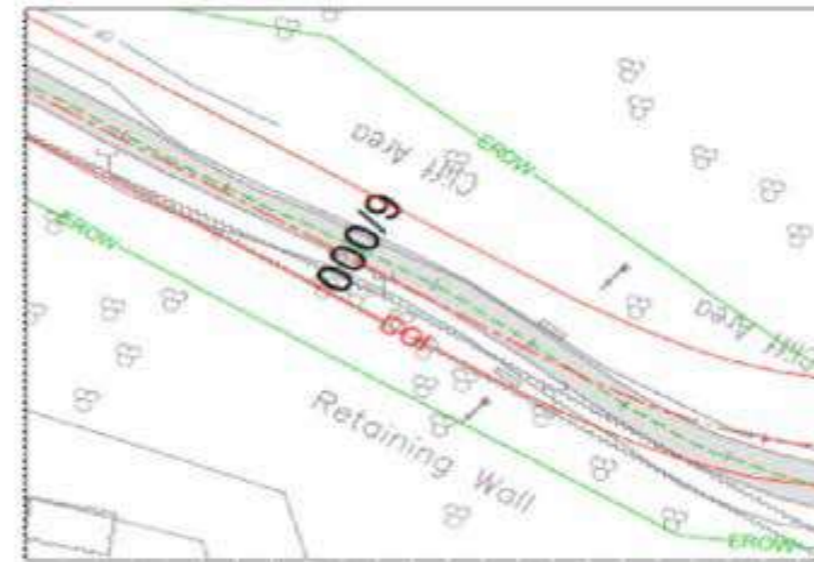
**Items for Relocation of Religious Shrine at Ch 5+989**

1. Identify a suitable location, within the proximity of existing location of the shrine but beyond the construction disturbance zone, in consultation with the local community leaders and or regular visitors to shrine
2. Clear and prepare the identified site for construction of platform as shown in the drawings/as per site requirements
3. All construction work for relocation of shrine shall be undertaken as shown in drawing /site construction and as agreed upon with the local community leaders and or regular visitors to shrine
4. All relocation work shall be completed prior to commencement of construction works related to road widening
5. Ensure utmost care and the shrine is handled diligently and carefully, while shifting from its existing location to the new location, in cooperation and/or consultation with local community leaders and or regular visitors to shrine
6. All works related to relocation of the religious shrine shall be essentially completed prior to commencement of construction related to the road widening works
7. Once the relocation is completed and all civil works are completed as shown in drawings/site requirements, facilitate a pooja ceremony to the satisfaction of local community/ regular visitors prior to handing over of the shrine
7. "3M" make high intensity retro reflective conspicuity tape (2" wide X 1mtr length) shall be pasted along edge of road near structure

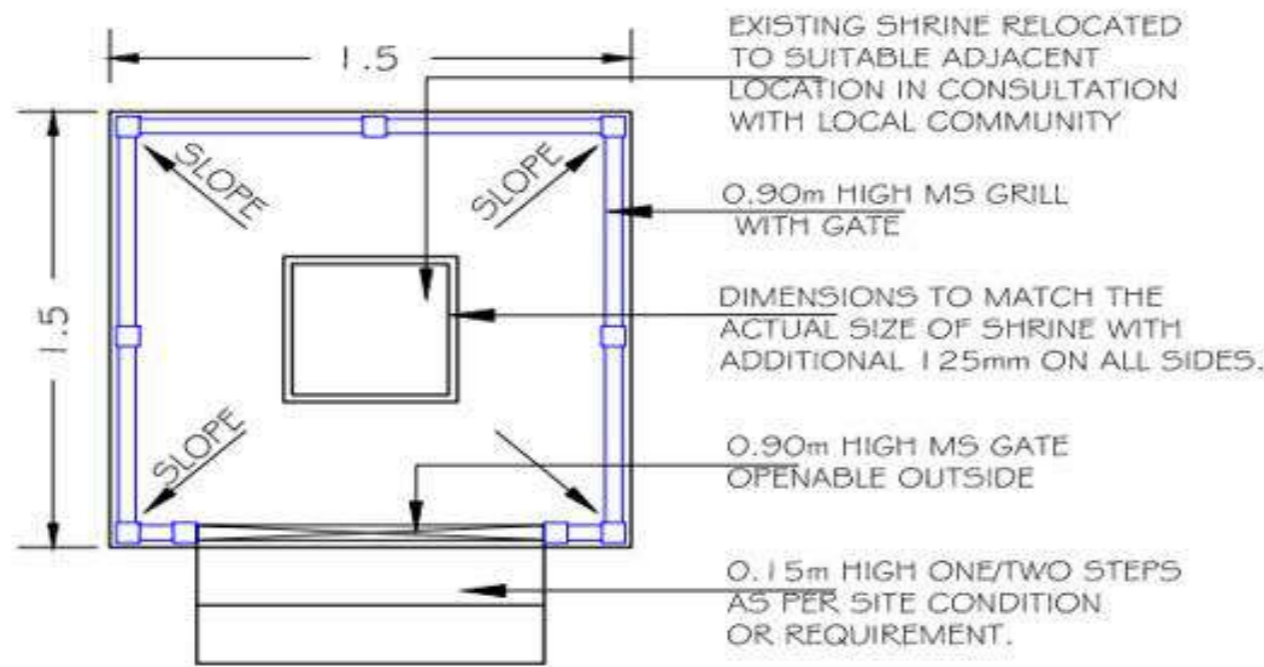
Note: All relocation work including the civil works shall be carried out in close consultation with local community leaders/regular users of shrine. All suggestions shall be duly considered with prior approval of Engineer-in-Charge.



**SECTIONAL ELEVATION**



**LOCATION PLAN**



**PLAN**



**PRESENT SITE PHOTOGRAPH AT CH 5+989**

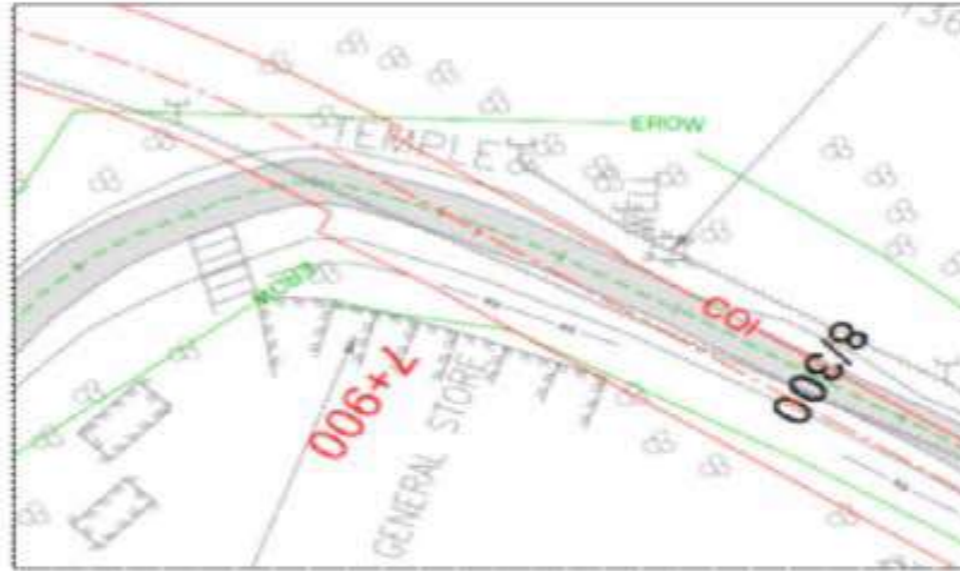
**RELOCATION & RENOVATION OF RELIGIOUS SHRINE AT CH.5+989.**

Note: Arrangements shown above are for guidance only. Working/GfC drawings are to be prepared by contractor and approved by CSC

**Figure 3-8: Relocation & Renovation of Religious Shrine at Ch. 5+989**



STEP TO BE SHIFTED FROM EXISTING POSITION TOWARDS LEFT HAND SIDE OR AS PER SITE CONDITION WITH SAME MARBLE FINISH



LOCATION PLAN



PRESENT SITE PHOTOGRAPH AT CH 8+275

**SHIFTING OF STEP AT PEPPAL PLATFORM AT CH 8+275.**

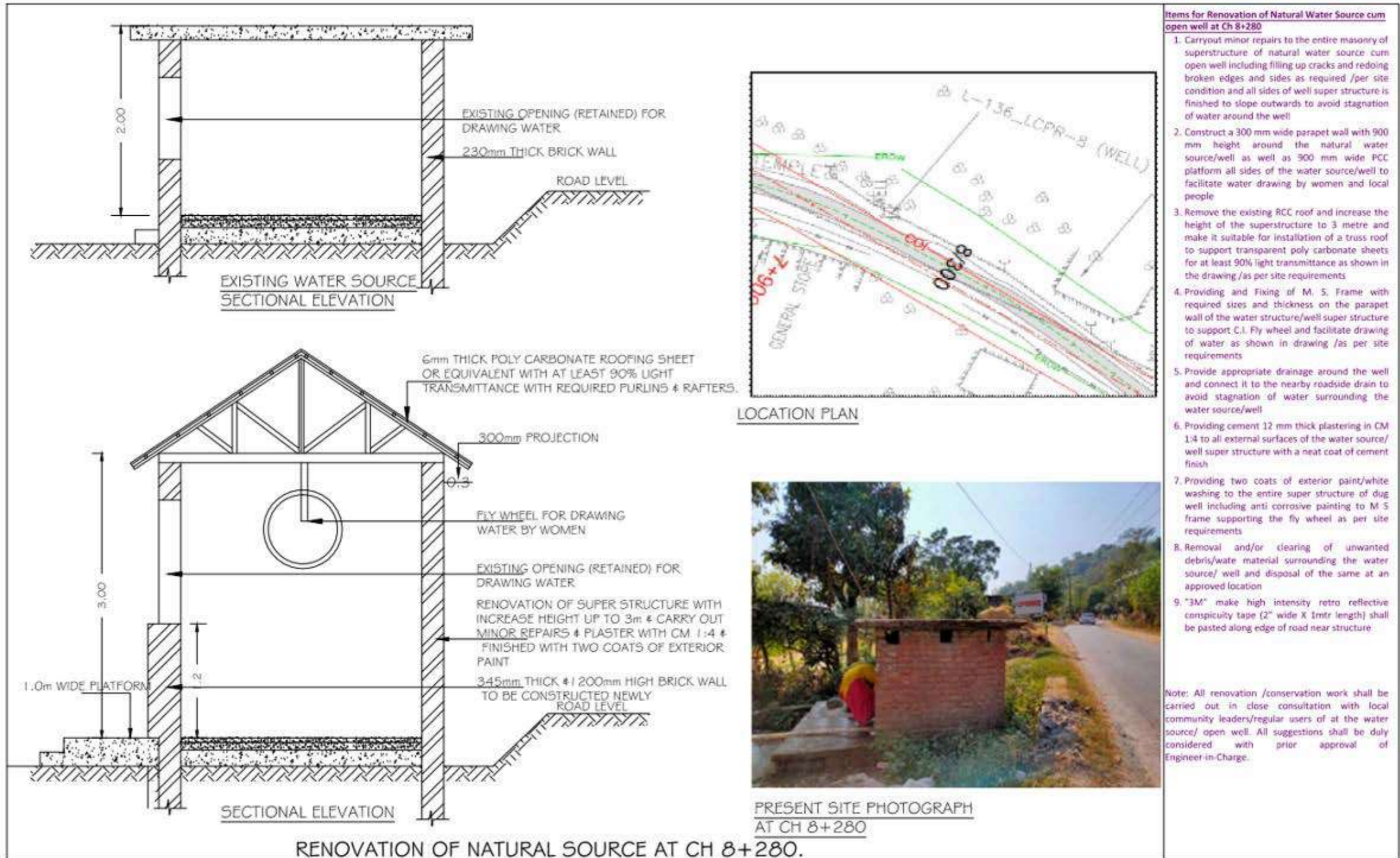
**Items for Relocation of climbing Steps of Religious Shrine at Ch 8+275**

1. Clear and prepare the identified side of the platform for shifting/relocating the climbing steps to the platform as shown in the drawings/as per site requirements
2. All construction work for relocation of climbing steps to the shrine shall be undertaken as shown in drawing /site construction and as agreed upon with the local community leaders and or regular visitors to shrine
3. All relocation work shall be completed prior to commencement of construction works related to road widening and same type of finish shall be achieved to the extent possible.
4. Ensure utmost care and the shrine is handled diligently and carefully, while shifting from its existing location to the new location, in cooperation and/or consultation with local community leaders and or regular visitors to shrine
5. All works related to relocation of steps of the religious shrine shall be essentially completed prior to commencement of construction related to the road widening works
6. Once the relocation is completed and all civil works are completed as shown in drawings/site requirements, facilitate a pooja ceremony to the satisfaction of local community/regular visitors prior to handing over of the shrine
7. "3M" make high intensity retro reflective conspicuity tape (2" wide X 1mtr length) shall be pasted along edge of road near structure

Note: All relocation work including the civil works shall be carried out in close consultation with local community leaders/regular users of shrine. All suggestions shall be duly considered with prior approval of Engineer-in-Charge.

Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-9: Shifting of Step at Peepal Platform at Ch. 8+275

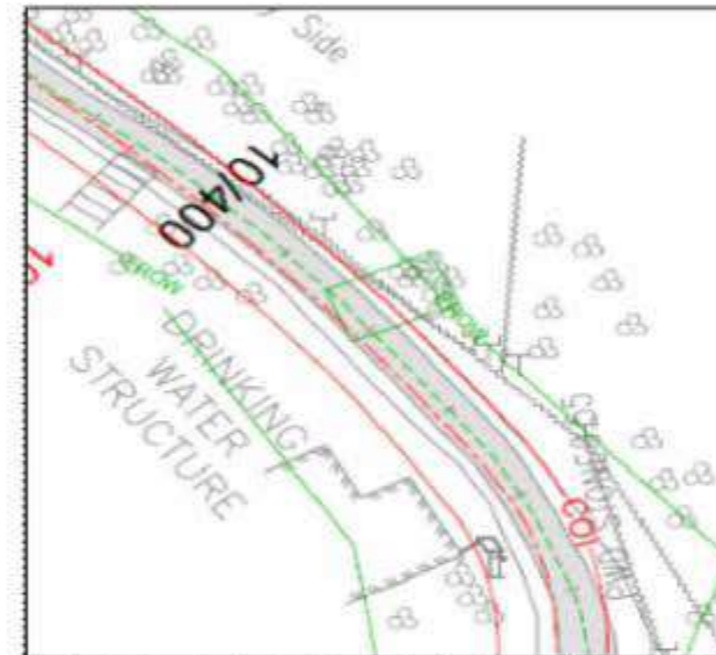


Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-10: Renovation of Natural Water Source at Ch. 8+280



PRESENT SITE PHOTOGRAPH  
AT CH 10+416



LOCATION PLAN



MINOR REPAIR TO ROOF  
(BOTH INSIDE & OUTSIDE) WITH  
12mm THICK PLASTER IN CM 1:4

MINOR REPAIR TO SUPER STRUCTURE  
(BOTH INSIDE & OUTSIDE) WITH 12mm  
THICK PLASTER IN CM 1:4

RECONSTRUCTION OF STEPS IN  
RANDOM RUBBLE MASONRY IN CM 1:4

RENOVATION OF NATURAL WATER SOURCE AT CH 10+416.

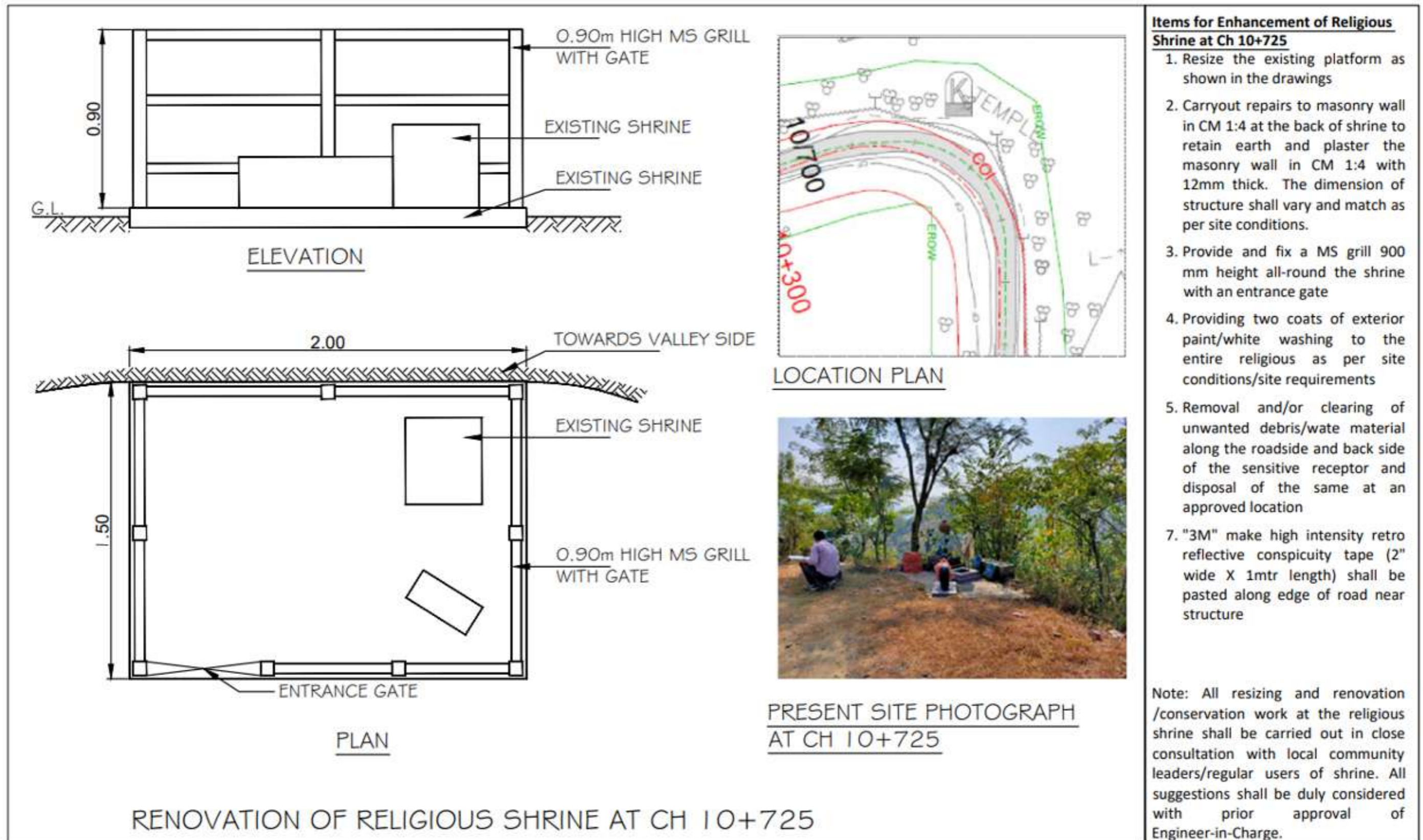
Items for Renovation of Natural Water Source at Ch 10+416

1. Install a new pre-cast RCC tank of 2000 litres capacity or rectangular shaped poly-propylene (pre-fabricated) tank in a suitable location in close proximity to natural water source, on a firm and 100 mm thick level bed of PCC.
2. Connect the newly placed tank with required pipe connections and plumbing fixtures to the natural water source
3. Place a pre-cast concrete trough 1.5 m long, 0.45 m wide and 0.45 m deep to facilitate drinking of water by stary animals and grazing cattle and connect it to pre-cast water storage tank as shown in drawing /as per site requirements
4. Level the area and provide 150 mm thick PCC in and around the natural water source, storage tank and trough, and PCC finished with sloping outwards to drain the water and no water stagnate as required /per site condition
5. Providing two coats of exterior paint/white washing to the entire water body structure as per site conditions/site requirements
6. Dismantle existing pre-cast tank and remove and/or clearing of unwanted debris/wate material surrounding the water source and disposal of the same at an approved location
7. "3M" make high intensity retro reflective conspicuity tape (2" wide X 1mtr length) shall be pasted along edge of road near structure

Note: All renovation /conservation work at the natural water source shall be carried out in close consultation with local community leaders/regular users of water source. All suggestions shall be duly considered with prior approval of Engineer-in-Charge.

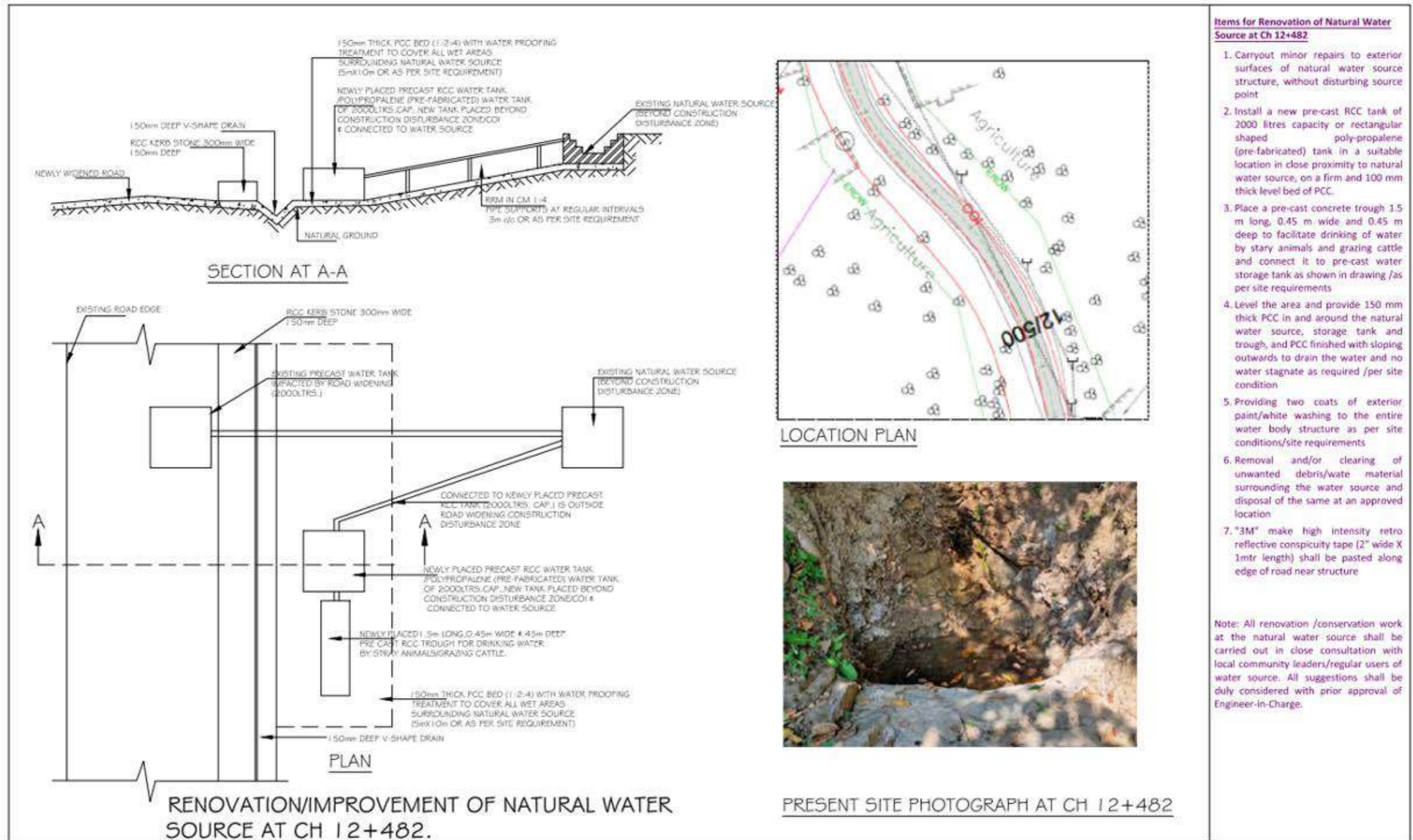
Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-11: Renovation of Natural Water Source at Ch. 10+416



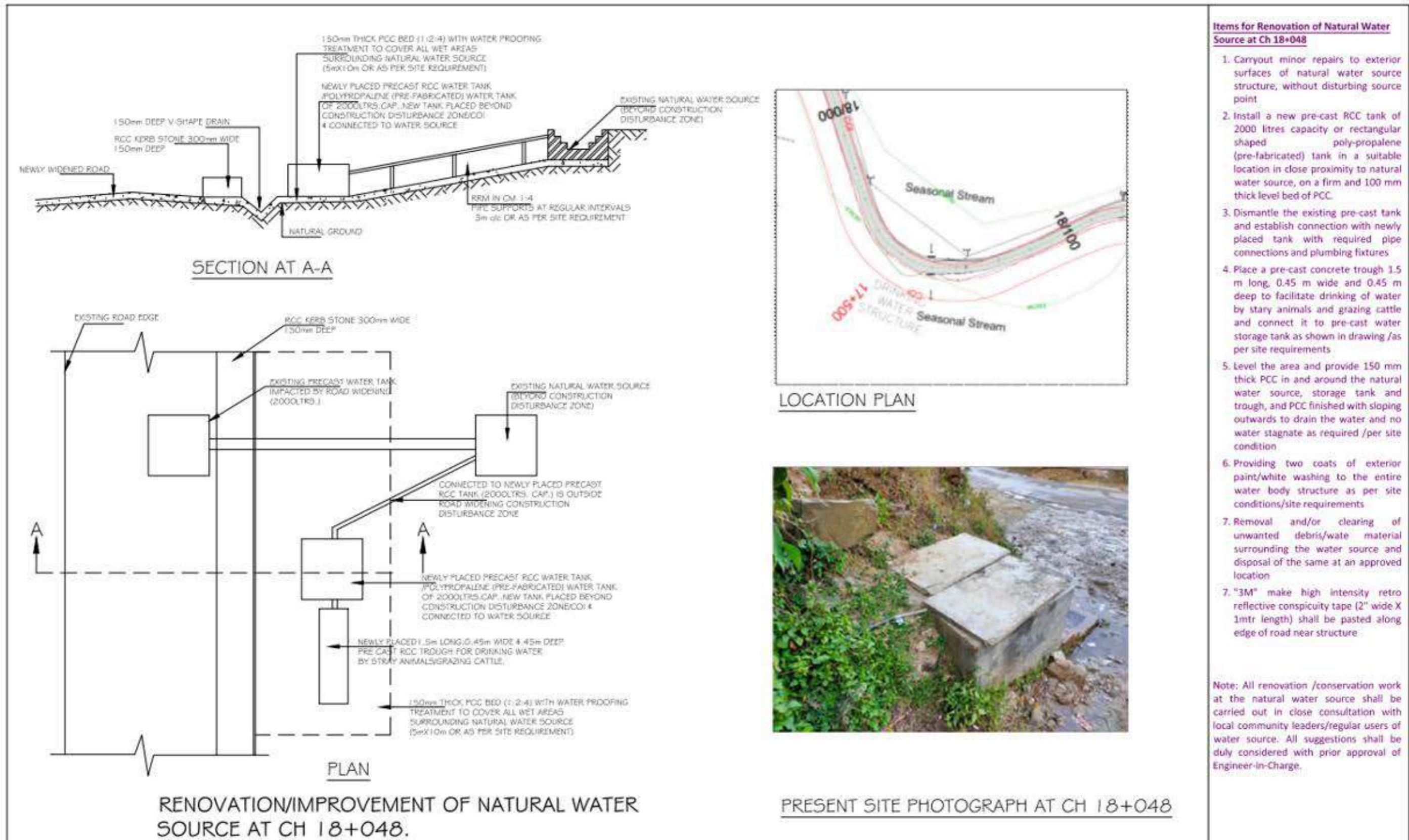
Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-12: Renovation of Religious Shrine at Ch. 10+725



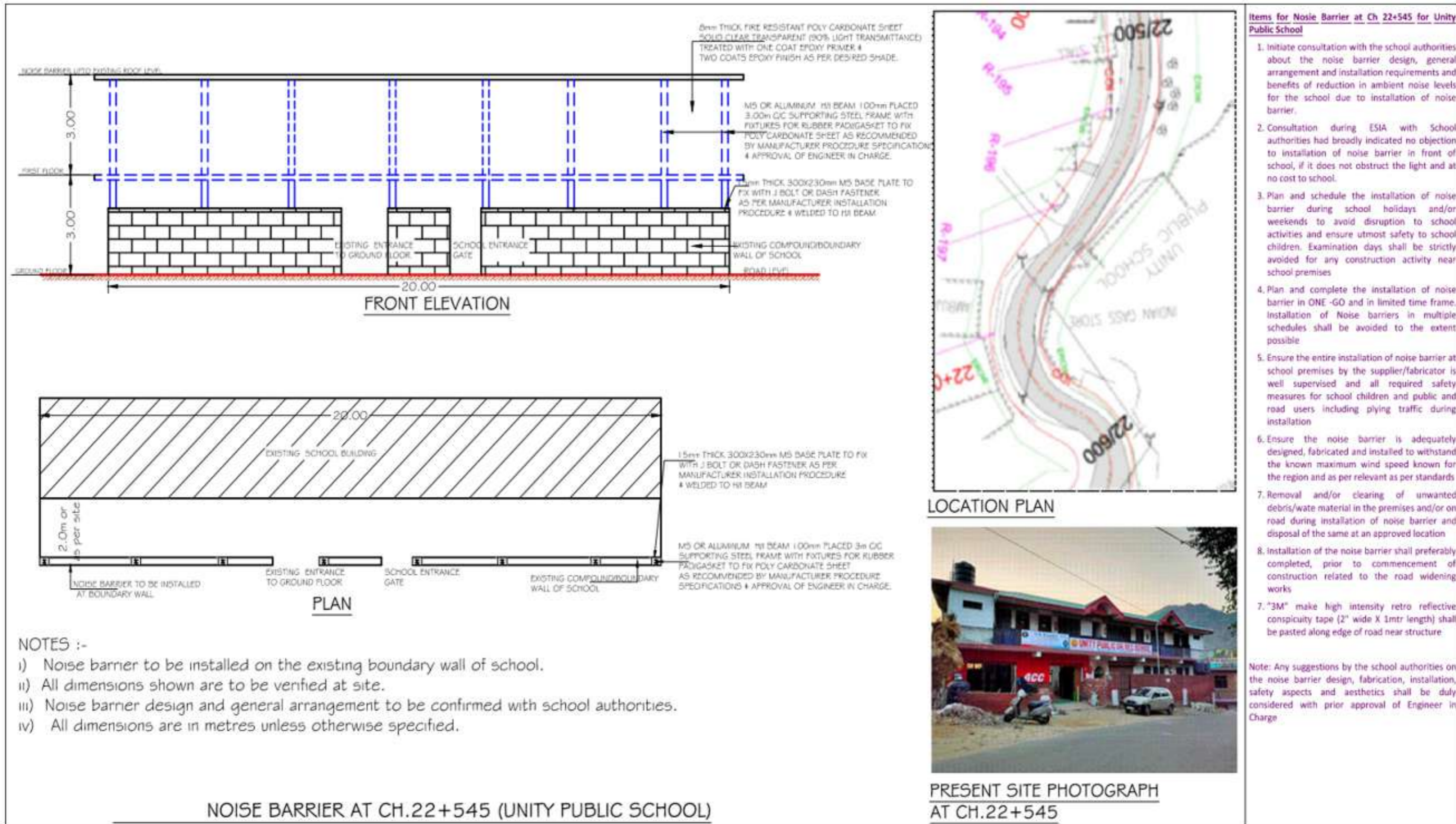
Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-13: Renovation/Improvement of Natural Water Source at Ch. 12+482



Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

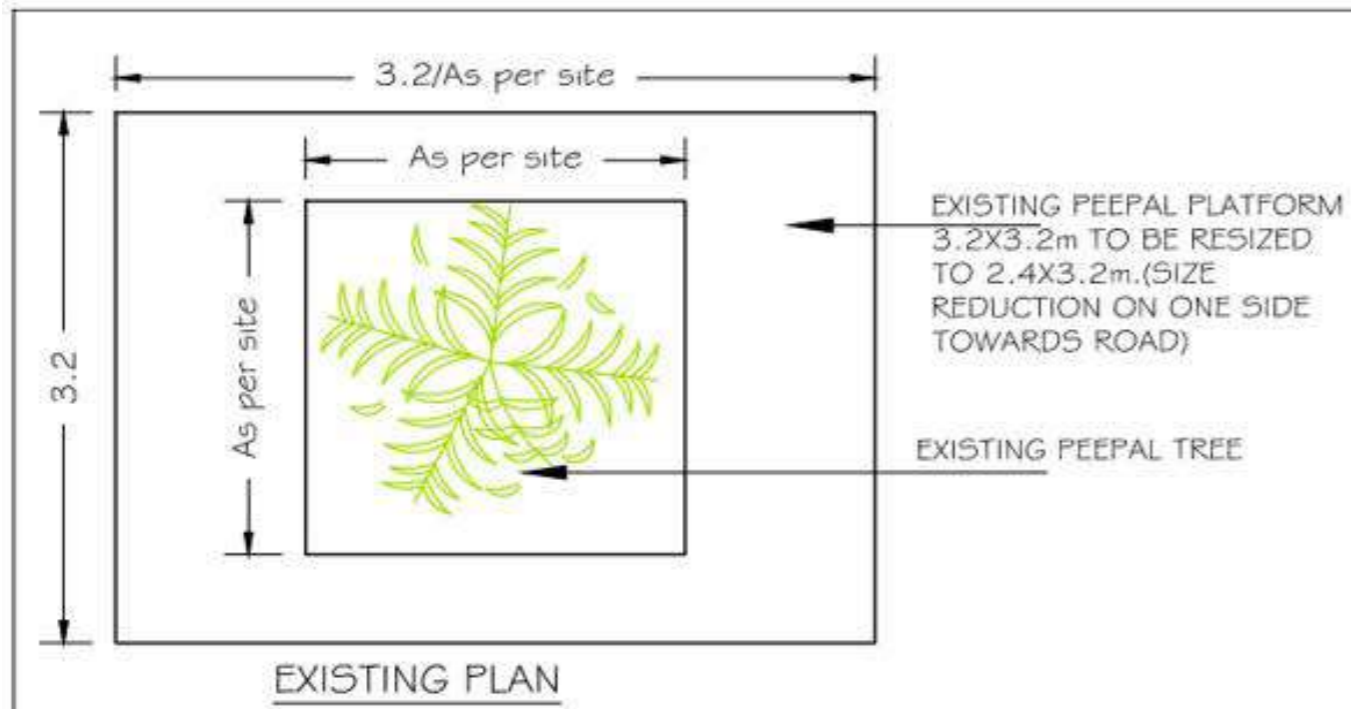
Figure 3-14: Renovation/Improvement of Natural Water Source at Ch. 18+048



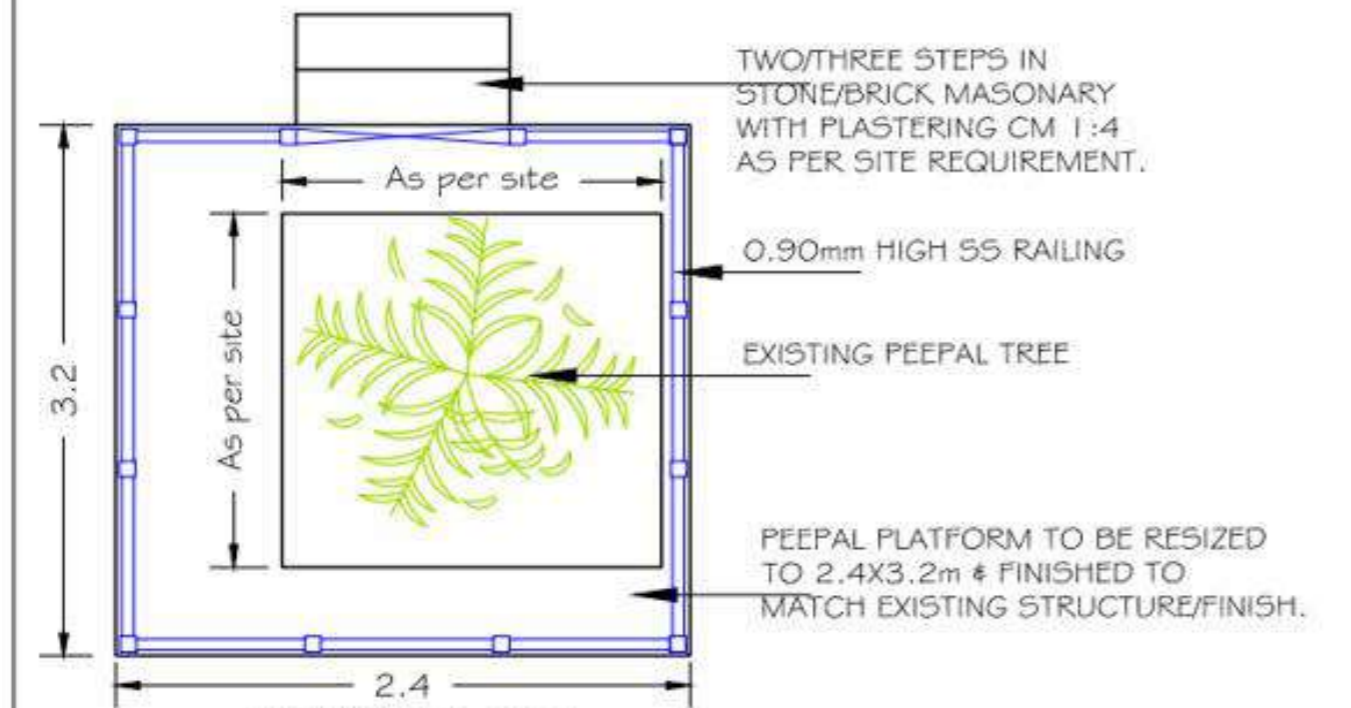
Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-15: Noise Barrier (Unity Public School) at Ch. 22+545



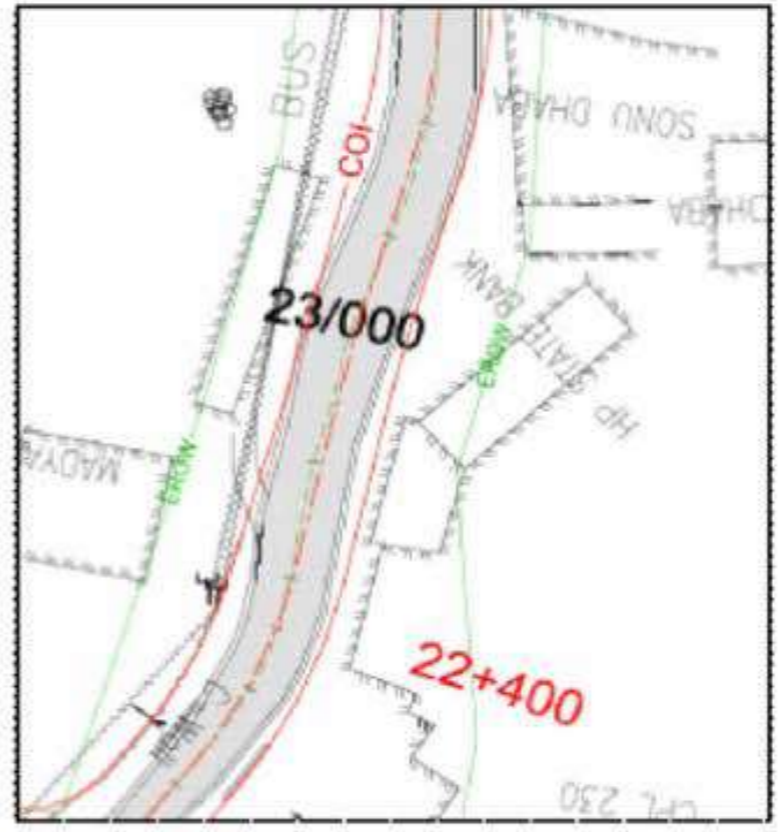


EXISTING PLAN



PROPOSED PLAN

RESIZING OF PLATFORM AT CH 22+997



LOCATION PLAN



PRESENT SITE PHOTOGRAPH AT CH 22+997

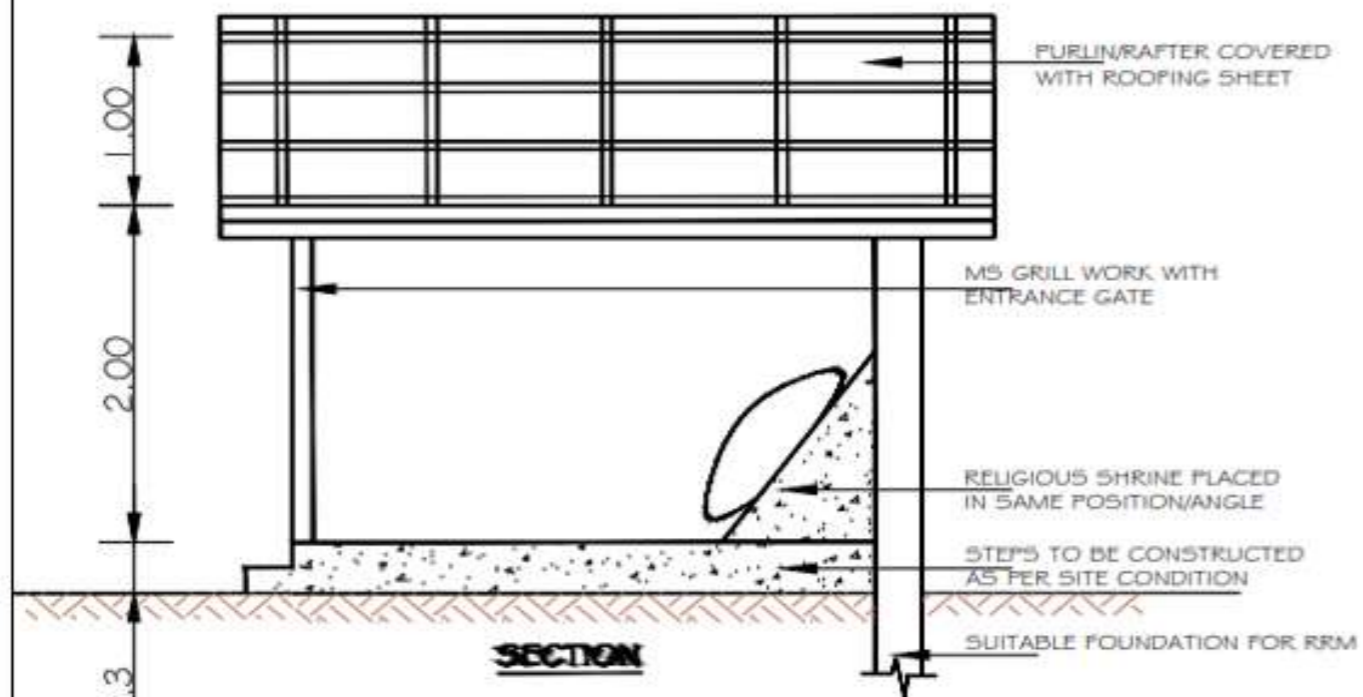
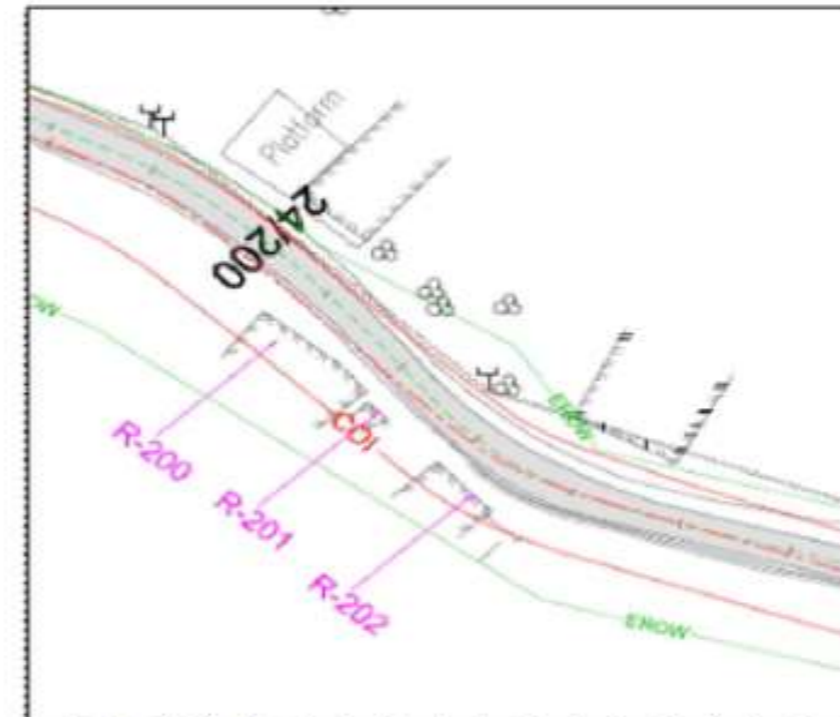
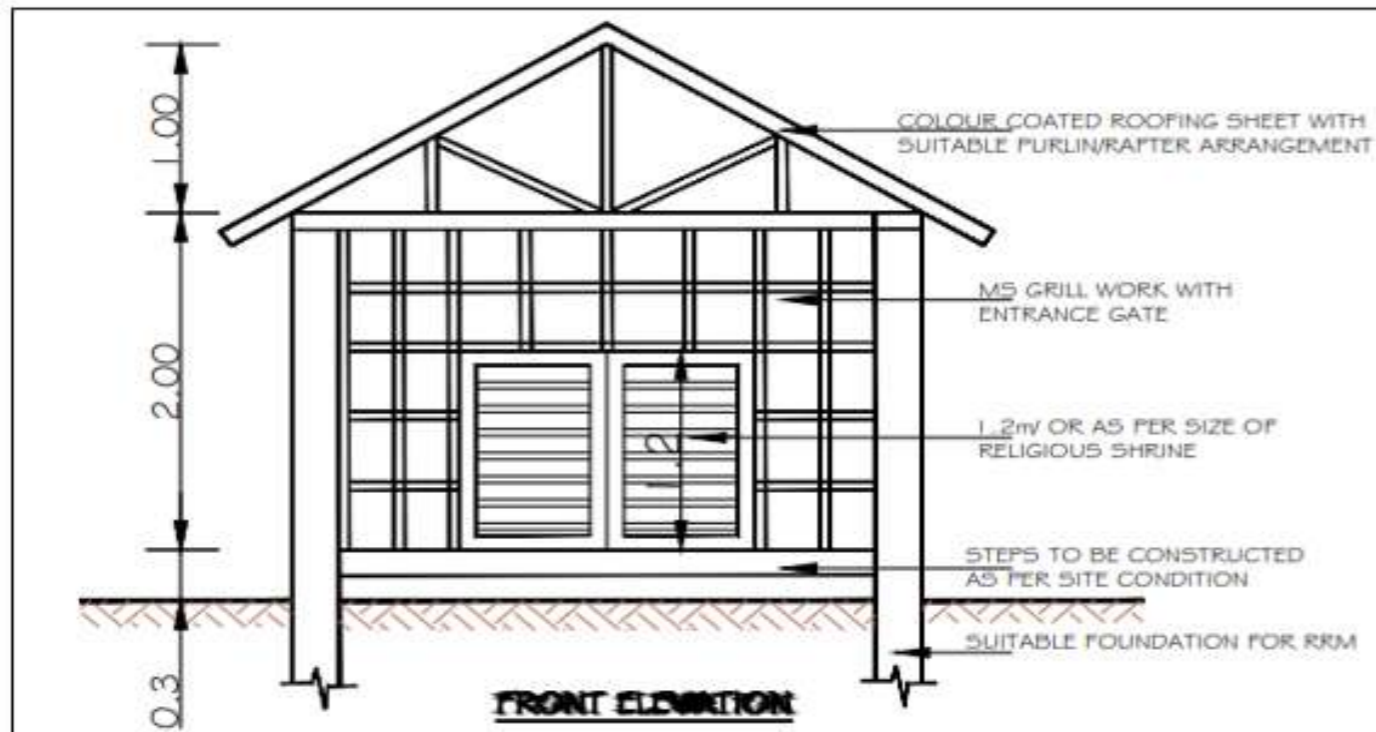
**Items for Resizing and renovation of Religious Shrine at Ch 22+997**

1. Partly dismantle the existing platform, towards the roadside as per dimensions shown in the drawing/site requirements, to avoid impact on the shrine
2. Reconstruct the platform as per re-sizing requirements with match the same finish (to extent possible) to the entire masonry work and carryout minor repairs like filling up cracks and redoing broken edges and sides as required /per site condition
3. Providing and Fixing of SS railing all along the edge of the platform (900 mm height and 20 metre long)
4. Providing two coats of exterior paint/white washing to the entire religious as per site conditions/site requirements
5. Removal and/or clearing of unwanted debris/wate material surrounding the shrine and disposal of the same at an approved location
7. "3M" make high intensity retro reflective conspicuity tape (2" wide X 1mtr length) shall be pasted along edge of road near structure

Note: All resizing and renovation /conservation work at the religious shrine shall be carried out in close consultation with local community leaders/regular users of shrine. All suggestions shall be duly considered with prior approval of Engineer-in-Charge.

Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-16: Resizing of Platform at Ch. 22+997



RELOCATION OF RELIGIOUS SHRINE AT CH 24+218

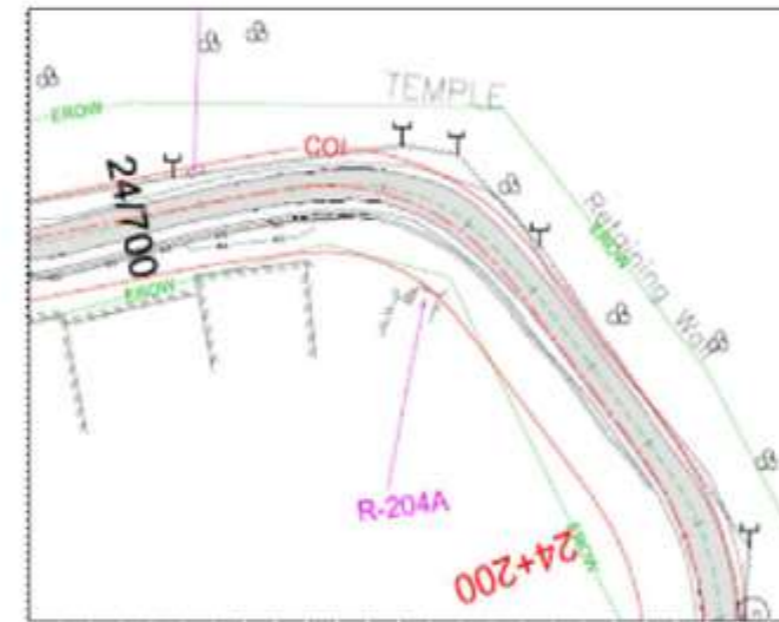
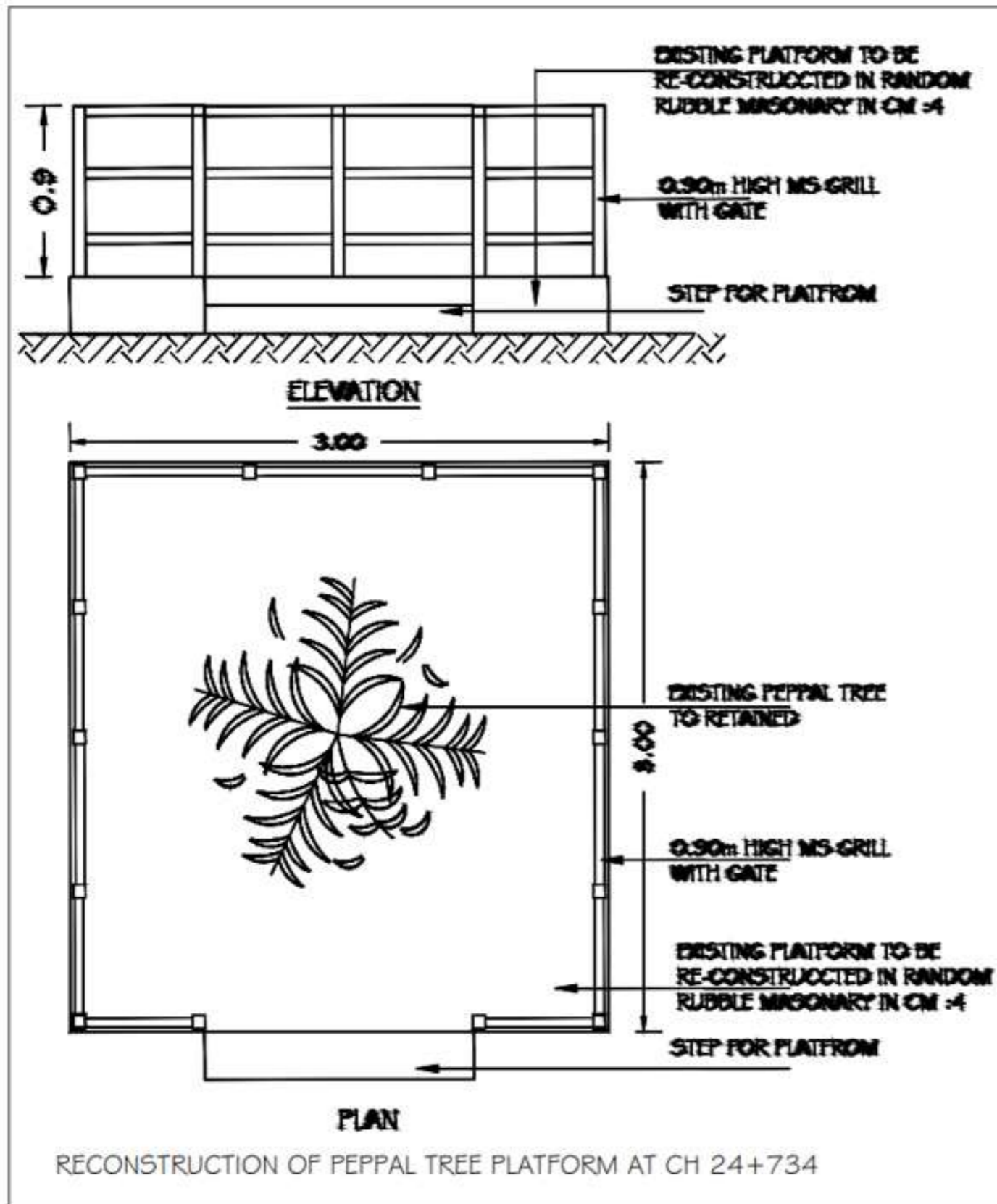
**Items for Relocation of Religious Shrine at Ch 24+218**

1. Identify a suitable location, within the proximity of existing location of the shrine but beyond the construction disturbance zone, in consultation with the local community leaders and or regular visitors to shrine
2. Clear and prepare the identified site for construction of platform as shown in the drawings/as per site requirements
3. All construction work for relocation of shrine shall be undertaken as shown in drawing /site construction and as agreed upon with the local community leaders and or regular visitors to shrine
4. All relocation work shall be completed prior to commencement of construction works related to road widening
5. Ensure utmost care and the shrine is handled diligently and carefully, while shifting from its existing location to the new location, in cooperation and/or consultation with local community leaders and or regular visitors to shrine
6. All works related to relocation of the religious shrine shall be essentially completed prior to commencement of construction related to the road widening works
7. Once the relocation is completed and all civil works are completed as shown in drawings/site requirements, facilitate a pooja ceremony to the satisfaction of local community/ regular visitors prior to handing over of the shrine
7. "3M" make high intensity retro reflective conspicuity tape (2" wide X 1mtr length) shall be pasted along edge of road near structure

Note: All relocation work including the civil works shall be carried out in close consultation with local community leaders/regular users of shrine. All suggestions shall be duly considered with prior approval of Engineer-in-Charge.

Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-17: Relocation of Religious Shrine at Ch. 24+218



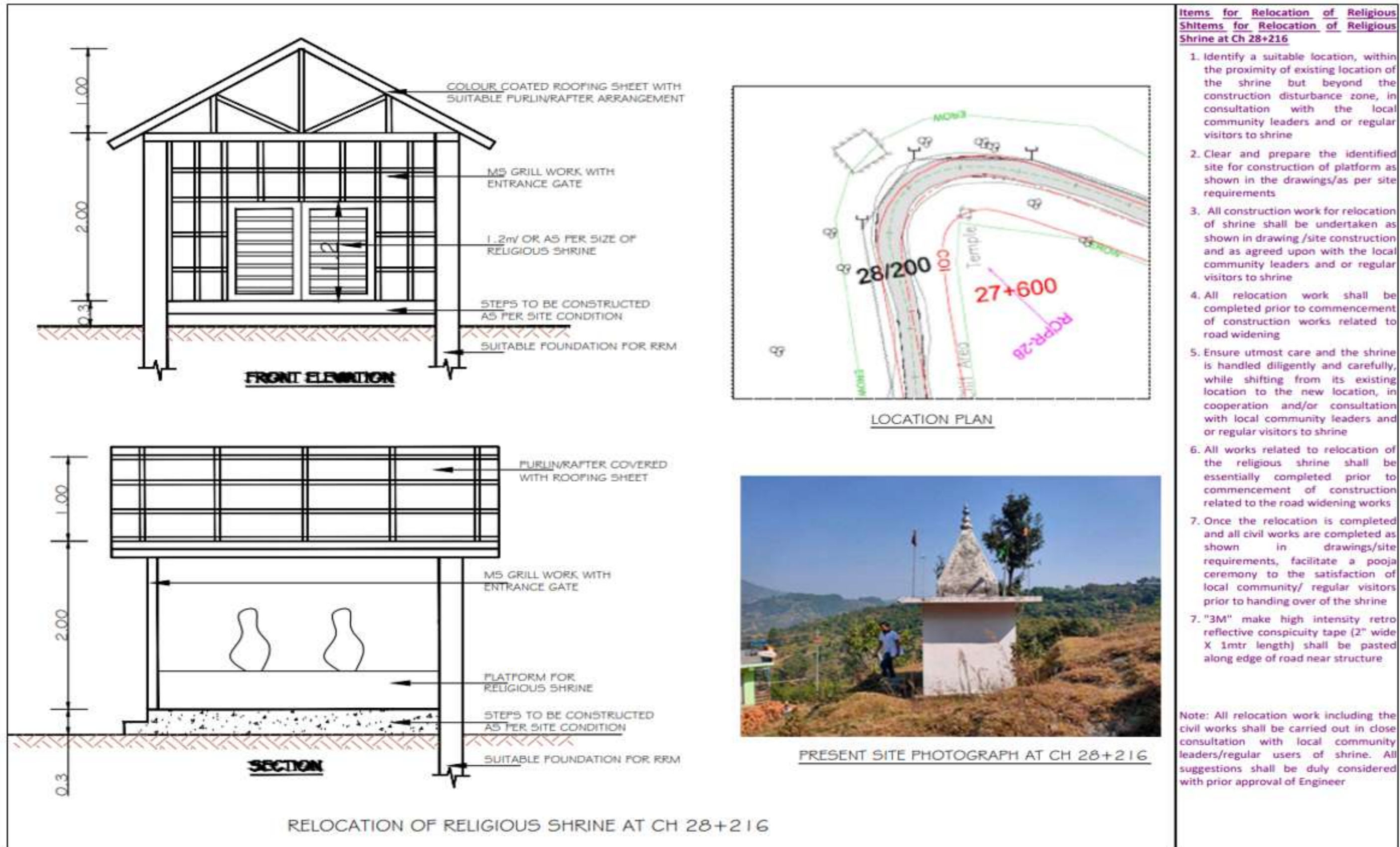
**Items for Renovation of Religious Shrine at Ch 24+734**

1. Dismantle existing masonry of the platform and scavenge/segregate the materials, which can be reused for reconstruction of masonry along with new materials as per required /shown in Drawings and site requirements
2. Provide and reconstruct the platform around the peepal tree as per dimensions shown in Drawings and space availability as per site conditions
3. Construct masonry steps to facilitate ease of entry and exit to the shrine, providing with SS hand railing as shown in the drawing/site requirements
4. Providing cement 12 mm thick plastering in CM 1:4 to all external surfaces of the platform with a neat coat of cement finish
5. Providing and Fixing of SS railing all along the edge of the platform (900 mm height and 20 metre long)
6. Providing two coats of exterior paint/white washing to the entire super structure of dug well including anti corrosive painting to M S frame supporting the fly wheel as per site requirements
7. Removal and/or clearing of unwanted debris/waste material surrounding the dug well and disposal of the same at an approved location
7. "3M" make high intensity retro reflective conspicuity tape (2" wide X 1mtr length) shall be pasted along edge of road near structure

Note: All renovation /conservation work at the religious shrine shall be carried out in close consultation with local community leaders/regular users of shrine. All suggestions shall be duly considered with prior approval of Engineer-in-Charge.

Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-18: Reconstruction of Peepal Tree Platform at Ch. 24+734



Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-19: Relocation of Religious Shrine at Ch. 28+216



PRESENT SITE PHOTOGRAPH  
AT CH 28+415



LOCATION PLAN

**Items for Renovation of Religious Shrine at Ch 28+415**

1. Carryout minor repairs to the entire masonry work like filling up cracks and redoing broken edges and sides as required /per site condition
2. Providing and Fixing of SS railing all along the edge of the platform (900 mm height and 20 metre long)
3. Reconstruction of steps to facilitate ease of entry and exit to the shrine, providing with SS hand railing as shown in the drawing/site requirements
4. Providing two coats of exterior paint/white washing to the entire religious shrine including the adjacent water tank structure for ablution purposes as per site conditions/site requirements
5. Removal and/or clearing of unwanted debris/wate material surrounding the shrine and disposal of the same at an approved location
7. "3M" make high intensity retro reflective conspicuity tape (2" wide X 1mtr length) shall be pasted along edge of road near structure

Note: All renovation /conservation work at the religious shrine shall be carried out in close consultation with local community leaders/regular users of shrine. All suggestions shall be duly considered with prior approval of Engineer-in-Charge.



**RENOVATION OF RELIGIOUS SHRINE/PEPPAL TREE  
WITH PLATFORM AT CH 28+415**

900mm HIGH SS RAILING ALL AROUND PLATFORM AS PER SITE REQUIREMENT

MINOR REPAIR TO MASONARY PLATFORM & 1.2mm THICK PLASTERING IN CM 1:4

RE CONSTRUCTION OF STEPS FOR EASE OF ENTRY & EXIT OF VISITORS WITH SS HAND RAILING AS PER SITE REQUIREMENT

Note: Arrangements shown above are for guidance only. Working/GFC drawings are to be prepared by contractor and approved by CSC

Figure 3-20: Renovation of Religious Shrine/ Peepal Tree with Platform at Ch. 28+415

## **4. ENVIRONMENT AND SOCIAL MANAGEMENT PLAN**

31. The environment and social impact mitigation and management measures during pre-construction, construction & operation phases of the project road are described in this section and summarized in **Table 4-1**.

### **4.1 Pre-Construction Stage Activities by CSC**

32. Prior to the Contractors' mobilization, the Construction Supervision Consultant (CSC) will be responsible to ensure that encumbrance free road stretches are readied/prepared for handing over to contractor.

33. The pre-construction stage activities by CSC shall comprise but not limited to the following

- Obtaining permissions for felling of 360 trees from the Department of Forests, GoHP which are within right of way and essentially to be cleared for road widening and ensuring timely felling of trees through the Forest Department, including removal of all stubs and clearance of site;
- Ensuring all utility utilities, which are within Right of way like water supply pipelines, electric poles, transformers, telephone poles etc. in accordance with encumbrance removal plan and close coordination with respective line departments;
- Co-ordination with HPRIDCL appointed NGO for implementation of RAP for the project corridors and ensure all encroachments within right of way by non-titleholders/ encroachers are removed, after disbursement of compensation, duly in accordance with RPF/RAP under HPSRTP. No encroachments shall be removed, prior to disbursement of entitlements and incase of any grievances, same shall be redressed, prior to removal of encroachment
- Ensure all grievances of PAH's/PAH's are received and are resolved in accordance with established GRM
- Prioritize the stretches for handing over to the contractor for commencement of construction

### **4.2 Pre-Construction Activities by Contractor**

34. The pre-construction stage activities of contractor involve;

- Procurement and mobilization of construction equipment / machinery such as crushers, hot mix plants, batching plants and other construction equipment and machinery
- Identification and selection of material sources (quarry and borrow material, water, sand etc.) and debris disposal locations
- Planning traffic diversions and detours, including arrangements for establishing campsites, workforce camps, material stack yards, crusher units, batch mix plants for WMM and concrete, hot mix plants, rented accommodation for supervisory staff. This activity includes identification of suitable lands, wherever required and obtaining requisite permissions or closing lease agreements
- Applying and obtaining of requisite permits/ licenses/ clearances like CTE, CTO, permissions for construction water sourcing, labour permission and similar other regulatory compliance requirements.
- Preparation of C-ESMP which include, OHS plan, Water and Waste Management Plan, Influx management Plan, Worker's camp management plan, CHS Plan, Transport (or road safety) management Plan, Quarry/borrow area management plan, establishment of GRM for labour and Site restoration Plan among others in accordance with the GoI and/or IFC /WB/EBRD workers Accommodation guidelines. All such plans prepared by contractor will be reviewed and approved by the CSC, prior to commencement of construction works.

### 4.3 Construction Stage Activities by Contractor

35. The environmental impact mitigation and management measures anticipated during different stages of project road construction as here under.

- General measures, which are akin to Good International Industry Practice (GIIPs), considered incidental to works and deemed to be included in the quoted bid price by the contractor.
- Project road specific mitigation measures and/or environmental enhancement measures considered as additional requirements that are to be implemented by the contractor against budget provision/ quoted bid price by the contractor.

36. The general measures (GIIPs) which are incidental to works as well as project road specific mitigation measures are described in **Tables 4-1** as ESMP. These will be integrated in the contract/bidding documents as mandatory contractual obligations of contractor. Thus, the contractor is expected to be fully conversant with the ESMP requirements of project road construction of road and accordingly make requisite cost provisions for implementing the SEMP at the bidding stage itself.

37. The construction stage activities require careful management to avoid environmental impacts. The activities that trigger the need for environmental management measures include a) Implementation of site-specific mitigation/management measures b) Monitoring the environmental quality parameters along project road operational sites and other sites like material stack yard, camp site offices, workforce camps, hot mix plants, crusher sites, batch mix plants. Environmental monitoring parameters may include air, noise, water and soil.

38. In addition, social issues which needs to be handled during construction phase include:

- Loss of land due to land-slides resulting from hill cutting activities
- Vibrations and cracks in structures or damage in buildings (of all types) adjacent to RoW due to construction works e.g., hill cutting activities within RoW
- Drying up of seasons springs or streams due to hill-cut operations
- Disruption to services such as water supply, power supply due to utility relocation and/or at times due to construction activities
- Disruption to access to private houses /properties during construction activities, temporarily;
- Disruption to traffic movement leading to time delays;
- differential impacts on vulnerable and disadvantaged population
- Dust emissions during construction leading to impacts on community health, crops and trees
- Likelihood of accidents due to road construction works;
- Possibility of gender-based violence arising from influx of migrant construction workers;
- Possibility of HIV/AIDS, among construction workers and roadside community;

### 4.4 Operation Stage Activities by Contractor

39. The ESMP measures during operation phase largely include environmental monitoring, upkeep and maintenance of nature-based bio-engineering solutions along project road. This shall be carried out by the contractor appointed for the maintenance contract.

**Table 4-1: Environment and Social Management Plan – Environmental Impacts**

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
<b>PRE-CONSTRUCTION ACTIVITIES BY CSC and HPRIDCL</b>				
1	Permission for Tree Felling	<ul style="list-style-type: none"> <li>The project road does not require any prior environmental clearances. Only permission for felling of trees, which are within the right of way shall be required from Department of Forests, GoHP.</li> <li>The application for tree permissions shall be made well in advance and no site clearance or pre-construction activities shall be initiated in stretches, which involve tree felling.</li> <li>Coordinate and ensure timely felling of trees through the Forest Department, including removal of all stubs and clearance of site.</li> <li>Undertake, any stipulations imposed by the Department of Forests, while issuing the tree felling permissions including compensatory plantation among others</li> <li>Prioritize the stretches for handing over to the contractor for commencement of construction</li> </ul>	Environment & Social Specialists of CSC for the Construction Package	Environmental Specialist of HPRIDCL under the overall guidance of Project Director
2	Clearance of encumbrances within RoW (Encroachments by non-title holders and squatters)	<ul style="list-style-type: none"> <li>Ensure all encroachments within right of way by title and non-titleholders are removed, after disbursement of compensation, duly in accordance with RPF/RAP under HPSRTP through an NGO appointed by HPRIDCL for implementation of RAP for the project corridors.</li> <li>No encroachments shall be removed, prior to disbursement of entitlements and in case of any grievances, same shall be redressed, prior to removal of encroachment</li> <li>Ensure all grievances of PAH's/PAH's are received and are resolved in accordance with established GRM</li> <li>The compensation and removal of private assets within the CoI, shall be in accordance to resettlement policy framework applicable to HPSRTP and as per the Resettlement Action Plan prepared for this specific corridor. As per the RAP, encroachers &amp; squatters shall be paid due entitlements (compensation and assistances) and shifted out of COI. Relocation of impacted CPRs shall be carried out as per the RPF provisions.</li> <li>Prioritize the stretches for handing over to the contractor for commencement of construction</li> </ul>	NGO for RAP implementation and Environment & Social Specialists of CSC for the Construction Package assisted by Revenue Department as required	Environmental Specialist of HPRIDCL under the overall guidance of Project Director
3	Relocation of Community Utilities and Common Property	<ul style="list-style-type: none"> <li>Ensure all utility utilities, which are within Right of way like water supply pipelines, electric poles, transformers, telephone poles etc. in accordance with encumbrance removal plan and close coordination with respective line departments.</li> <li>Prioritize the stretches for handing over to the contractor for commencement of construction</li> </ul>	NGO for RAP implementation and Environment & Social Specialists of CSC for the Construction Package in co-ordination with line departments as required	Environmental Specialist of HPRIDCL under the overall guidance of Project Director



S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
<b>PRE-CONSTRUCTION ACTIVITIES BY CONTRACTOR AND CONSTRUCTION SUPERVISION CONSULTANTS (CSC)</b>				
4	ESHS Performance Requirements under the Contract	<ul style="list-style-type: none"> <li>The ESHS (Environment, Social, Health and Safety) performance requirements by the contractor under contract have been specified and incorporated as special conditions and performance requirements in all bid documents of contract packages (ref. <b>Appendix-11</b>).</li> <li>Adequate cost provisions for implementation of ESHS requirements are included in the item rates, so that contractor can perform requirements in a fair and objective manner.</li> <li>Provision of 2% of contract amount has been earmarked as ESHS performance security in the bidding documents. Thus, the contractor is expected to be fully aware of ESHS performance requirements at the bidding stage and accordingly deemed to have priced the performance requirements at the bidding stage itself.</li> <li>The ESHS performance requirements incorporated in the bid documents, obligate the contractor, upon mobilization, to prepare a Contractor's ESMP (C-ESMP), which shall include impacts mitigation and management plan, environmental enhancement plan, OHS plan, labor management plan, labor Influx management Plan, workers' campsite management plan, GRM for workers', traffic management and road safety management plan, COVID-19 considerations and among others in accordance with the GoI, GoHP, IFC &amp; WB requirements.</li> <li>The C-ESMP submitted by the contractor shall be reviewed in consultation with HPRIDCL and approved by the CSC, prior to commencement of construction works.</li> <li>The approved C-ESMP also be reviewed periodically (as and when required but at least once in three (3) months) by CSC and updated in a timely manner, to address changed requirements, if any during project implementation.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
5	Disaster Management & Emergency Response Plan	<ul style="list-style-type: none"> <li>As part of C-ESMP, Contractor shall prepare Disaster Management and Emergency Response Plan at the project road level and same shall be review and approved by CSC.</li> <li>The ERP at project road construction level in an event of climate change induced natural disasters and/or any other natural calamities shall comprise the following: <ul style="list-style-type: none"> <li>In order to ensure the safety of work force at operational sites and safe evacuation of workforce in the event of natural disaster and/or any other natural calamities, the project road construction contractor shall have an emergency response plan (ERP).</li> <li>As part of the ERP, the project contractor shall establish and maintain regular coordination with the designated officers for Disaster Management at district/sub-division levels. Maintaining regular coordination will enable to seek quick response, in the event of natural disaster and/or any other natural calamity.</li> <li>Mandi district has a Disaster Management Plan at district and subdivision level, which provide the institutional arrangements, designated officers, emergency response systems,</li> </ul> </li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<p>infrastructure facilities like hospitals, fire stations, police station at tehsil, sub-division and village levels.</p> <ul style="list-style-type: none"> <li>○ All project operations shall be planned and coordinated in tandem with the daily/weekly weather predictions/alerts issued by competent authorities as relevant for the district/project road and all such alerts shall be duly considered and review the scheduled work programs on a daily basis.</li> <li>• At project level, contractor shall designate an Incident Controller (IC), Emergency Controller (EC), Assembly Coordinator (AC) and other required personnel for the emergency response mechanism in an event of natural disaster/ calamity in line with the ERP.</li> <li>• The preparation and implementation of ERP shall form a part of C-ESMP of the contractor and checked and approved by the CSC.</li> <li>• All work force irrespective of levels are to be provided with training and periodic mock drills to ensure the preparedness for any emergency situations, always in short notice.</li> <li>• The local community along project road shall also be engaged in mock drills for proactive participation in case of any natural hazards or disaster/ calamity.</li> <li>• A template for the Disaster Management and Emergency Response Plan has been included in Appendix-17 of ESMP volume, which may be further updated suiting to requirements of contractor's scale of establishment after the mobilization.</li> </ul>		
6	Work Zone Safety Requirements	<ul style="list-style-type: none"> <li>• Prior to commencement of construction, the contractor will prepare and submit Contractor's ESMP (C-ESMP), which will include contractor's management plan to comply with the project's safeguard requirements and Management Strategies and Implementation Plans (MSIPs) for (i) Work Management; (ii) traffic and work zone safety management plan for the prioritized encumbrance free stretches, in accordance with approved implementation schedule.</li> <li>• In addition, the contractor will be contractually obligated to implement work zone safety arrangements confirming to the requirements of IRC: 67 and IRC: SP: 55: 2014, which include provision of PPEs, fixed/ mobile barricades between work area and pedestrian/ traffic and required measures for ensuring community safety during construction activities.</li> <li>• The requirements also include site specific traffic management plan for all types of works along with work zone safety check list. A typical diagram showing traffic management during construction phase as shown in Figure 3-1 Section 3 and an illustrative checklist for work zone safety is given in Appendix-18 of ESMP volume.</li> <li>• The responsibility of contractor to manage these risks is clearly reflected in the contractual obligations of the Civil Works Contractor with appropriate mechanisms for addressing non-compliance. The bid documents for construction will incorporate requirements for Environment, Social, Health and Safety (ESHS) including list of applicable labor laws and</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<p>community safety provisions for periodic reporting by contractors. Commencement of any activity by contractor without prior approval of these requirements will be treated as “fundamental breach of contract”.</p> <ul style="list-style-type: none"> <li>The C-ESMP will be approved by the CSC, prior to the commencement of construction activities, will be periodically reviewed by CSC (but not later than every 3 months) and updated in a timely manner by the Contractor, to ensure that it contains appropriate measures for the work zone and community safety throughout construction phase</li> </ul>		
7	Orientation and submission of C-ESMP by contractor	<p>Contractor is to be oriented with the ESMP stipulations and ESHS requirements under the contract as well as ESS requirements of the World Bank (ref. <b>Appendix-9</b>). This shall include but not limited to the following</p> <ul style="list-style-type: none"> <li>Contractual Obligations of the Contractor to submit Contractor’s C-ESMP Environmental and Social Management Plan</li> <li>Regulatory compliance requirements like obtaining CTE and CTO from State Pollution Control Board</li> <li>Establishing GRM (Grievance Redress Mechanism) for Contractors’ workforce as well as for community members for social and environmental issues</li> <li>Implementation of various plans required under C-ESMP related to Occupation Health &amp; Safety (OHS), traffic and road safety, community health and safety (CHS), hazardous and non-hazardous waste management plan, camp site management, emergency response plan ERP) including conducting periodic mock drills, opening up of borrow area and muck disposal and including their restoration plan etc.</li> <li>Workforce/Labour Management Procedures in line with HPRIDCL’s LMP</li> <li>Procedures for Worker’s safety at all operational sites</li> <li>Implementation of GBV risk mitigation strategy plan at workforce camps, operational sites and at other hotspots likely to be frequented by workers after work hours/leisure and/or on weekly off days</li> <li>Stakeholder Engagement</li> </ul> <p>Contractor shall appoint one Environmental Officer, one Social-cum-Community Liaison Officer and one Health and Safety Officer, who shall be solely be responsible for implementation of all the ESMP stipulations and ESHS requirements under the contract as well as ESS requirements of the World Bank in close co-ordination/consultation with Environmental and Social Specialists under CSC and HPRIDCL.</p> <p>The contractor shall be required to submit contractor’s C-ESMP, which shall include OHS plan, Water and Waste Management Plan, Workforce Influx management Plan, Worker’s camp</p>	Contractor Orientation by	<p><u>Supervision &amp; Orientation by:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<p>management plan, CHS Plan, Transport (or road safety) management Plan, Quarry/borrow area management plan, establishment of GRM for labour and Site restoration Plan among others in accordance with the GoI and/or IFC/WB workers accommodation guidelines.</p> <p>Some of the GRM dissemination avenues for construction workers are;</p> <ul style="list-style-type: none"> <li>• During Induction training for new workers</li> <li>• During Toolbox meet/briefings by work supervisors</li> <li>• During periodic tail gate sessions, to review and refresh site protocols on safety procedures at work</li> <li>• Through pictorial illustrations and posters in local language installed at prominent places like entry/exit points, canteen, entertainment areas, health camps sites etc.</li> <li>• During awareness campaigns for safety at work and response to Emergency Response Plans</li> <li>• Awareness and briefing on community safety, while at work</li> </ul> <p>All C-ESMPs prepared by Contractor covering all above-mentioned aspects shall be reviewed in consultation with HPRIDCL and approved by the CSC prior to commencement of construction works.</p>		
8	<p>COVID - 19 Requirements for Contract Workers with Particular Reference to Migrant Construction Workers</p>	<ul style="list-style-type: none"> <li>• In respect of COVID situation, Standard Operating Procedures (SOPs) and Guidelines for Construction Sites for COVID-19 Outbreak issued by Central Public Works Department, Government of India, May 2020 and HP State Government order issued on May 2, 2020 by Govt. of HP under clause 3 of the Himachal Pradesh Epidemic Disease (COVID 19) Amendment regulations 2020 and all related notifications, as &amp; when notified and applicable to Project Road.</li> <li>• Contractor shall mandatorily adhere to these GoHP and GoI COVID -19 SOPs at all construction sites, which shall cover all contract workers, particularly migrant construction workers during the mobilization and subsequent phases of construction by the contractor: <ul style="list-style-type: none"> <li>• Induction of new batch of migrant workers, possibly some of them could be symptomatic or asymptomatic COVID carrier(s)</li> <li>• Migrant workers returning to work after visiting native places and/or hometowns, possibly asymptomatic COVID carriers and could have got infected either on way home or on way back to project site</li> <li>• Any worker, who could have got infected from local community during visit to local market areas for purchase of some daily-needs</li> <li>• Contractor shall adopt Labour Management Procedure in line with LMP of HPPRIDC and shall submit to CSC</li> </ul> </li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> <li>• Details in writing of the measures being taken to address the risks and SOPs that cover the following aspects               <ol style="list-style-type: none"> <li>a. Conducting pre-employment health checks</li> <li>b. Controlling entry and exit from site/workplace</li> <li>c. General hygiene, cleaning and waste disposal at all operational sites</li> <li>d. Maintaining social distance of minimum 1.5 meter at work sites as well as at workforce camps</li> <li>e. Provision of PPEs for covering of face with masks/cotton cloths, use of sanitizers, frequent washing of hands</li> <li>f. Creating awareness and prohibiting spitting in public, avoid use of chewing gum, tobacco in all forms,</li> <li>g. Instruct/encourage reporting of flu-like-illness symptoms and creation of isolation/quarantine rooms for any workers reporting/showing COVID symptoms until shifting to designated COVID hospitals</li> <li>h. Adjusting work practices from COVID consideration</li> <li>i. reviewing accommodation arrangements maintain social distancing norms</li> <li>j. reviewing accommodation arrangements, to see if they are adequate and designed to reduce contact with the community</li> <li>k. reviewing contract durations, to reduce the frequency of workers entering/exiting the site</li> <li>l. rearranging work tasks or reducing numbers on the worksite to allow social/physical distancing, or rotating workers through a 24-hour schedule</li> <li>m. providing appropriate forms of personal protective equipment (PPE)</li> <li>n. putting in place alternatives to direct contact, like tele-medicine appointments and live stream of instructions.</li> <li>o. Instances of spread of virus</li> <li>p. Training and communication with workers</li> <li>q. Communication and contact with community</li> </ol> </li> <li>• Provision of medical insurance covering treatment for COVID-19, sick pay for workers who either contract the virus or are required to self-isolate due to close contact with infected workers and compensation payment in the event of death</li> <li>• Designating/appointing a COVID-19 focal point officer with responsibility for monitoring and reporting on COVID-19 issues and liaising with competent authorities designated by district administration or the State Government.</li> </ul>		

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> <li>Contractor to convene regular meetings with the project health and safety specialists and medical staff (and where appropriate with local health authorities), and to take their advice in designing and implementing the agreed measures.</li> <li>Identify a senior person as a focal officer with responsibility for monitoring and reporting on COVID-19 issues and liaising with competent authorities designated by the district administration or State Government authorities point</li> <li>Contractor's coordination arrangements, particularly at site where there are a number of contractors and therefore (in effect) different work forces (CSC could request the main contractor to put in place a protocol for regular meetings of the different contractors)</li> <li>Contractors to ensure regular checks on whether the workers are informed/encouraged to use the existing project grievance mechanism to report concerns relating to COVID-19</li> </ul> <p>The monitoring of performance of contractors including the implementation of C-ESMP and meeting the ESHS performance requirements by the contractor shall be overseen and managed by the CSC under the overall guidance and direction of Project Director.</p>		
9	Joint Field Verification	<ul style="list-style-type: none"> <li>The contractor shall carry out joint field verification with CSC to ascertain any possibilities of saving trees, protection/preservation of community resources, prior to commencement of construction by the construction Contractor</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
10	Crushers, Hot-mix Plants and Batching Plants Location	<ul style="list-style-type: none"> <li>All establishments/facilities by the contractor shall be set up sufficiently, away from settlements and agricultural lands or any commercial establishments. Such facilities shall preferably be located at least 500 m away from forest, water bodies, and sensitive receptors like hospital, schools, temples and the nearest dwelling preferably in the downwind direction.</li> <li>The Contractor shall submit a detailed layout plan for all such site establishments and prior approval of CSC shall be necessary. Site specific protection measures required at such location are to be considered to minimize associated environmental and social risk, if the site selection is in rolling terrain.</li> <li>Arrangements to control dust pollution through provision of wind Screens, water sprinklers, and dust extraction systems shall have to be provided at pollutant sources in all such operational sites.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> <li>For dust suppression, water sprinkling is to be done as per requirements so as to ensure that there are no visible dust levels at any establishment sites and /or operational sites.</li> <li>The crushers, hot mix plants and batching plants shall conform the emission norms as well as noise level limits stipulated by CPCB and/or HPSPCB</li> <li>Consent to Establish (CTE) and Consent to Operate (CTO) shall be obtained from HPSPCB by the Contractor prior to establishing or operation of any such facilities under this contract. A copy of permissions/consents should be submitted to CSC.</li> <li>The contractor shall carry out periodical environmental monitoring at each of these locations/ operational sites as per Monitoring Program in ESMP and/or HPSCB norms and shall also carry out necessary servicing/ repair/ maintenance of machineries and equipment to comply with permissible emission standards for air and noise of GoI and GoHP.</li> </ul>		
11	Deployment of Construction Vehicles, Equipment and Machinery	<ul style="list-style-type: none"> <li>All vehicles, equipment and machinery deployed for construction shall conform to the relevant emission norms. The applicable standards under the Environment Protection Act, 1986 and Motor Vehicles Act, (Amendment) 2019 shall be strictly adhered to.</li> <li>The Contractor shall maintain a record of Pollution Under Control (PUC) certificates for all vehicles and machinery used during the contract period which shall be submitted to CSC for verification, whenever required.</li> <li>The contractor shall maintain record and conduct fitness test of all vehicles and machinery at regular interval of one year and fitness certificated shall be submitted to CSC. Only fit vehicles and machinery shall be deployed during construction.</li> <li>All vehicles and machinery used during construction should be well maintained and conform to currently applicable emission norms.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
<b>IDENTIFICATION AND SELECTION OF MATERIAL SOURCES</b>				
12	Selection and Management of Borrow Areas	<ul style="list-style-type: none"> <li>The Contractor shall not open any new borrow area without obtaining Environmental Clearance (EC) from DEIAA as required under EIA notification 2006 as amended for minor mineral on 15th Jan 2016 (ref. <b>Appendix-1</b>).</li> <li>The CSC's approval for contractor's proposed borrowing of area shall be mandatory along with other required statutory requirements. No borrow area shall be operated in forest and agriculture land, and near to water bodies. If identified borrow area land belongs to Govt, then contractor shall obtain a prior approval from respective government department/authorities.</li> <li>The Contractor shall not start borrowing earth from selected borrow areas until formal agreement is signed between landowner and Contractor and Borrow Area management and redevelopment plan is submitted and approved by CSC. The operation of borrow area shall strictly adhere to approved borrow area management and redevelopment plan.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility																															
			Planning and Execution	Supervision/ Monitoring																														
		<ul style="list-style-type: none"> <li>Avoid construction of new haul roads for accessing borrows areas, to the extent possible. Preference shall be given for using of existing roads, wherever possible. The contractor may decide on using of identified potential borrow area locations, after complying aforementioned requirements.</li> <li>Following are the identified potential borrow area locations and contractor may or may not use these based on its requirement and ease of obtaining requisite permissions for borrowing earth thereof from respective Government Departments.</li> </ul> <table border="1"> <thead> <tr> <th>Borrow Area</th> <th>Chainage (km)</th> <th>Lead (m)</th> <th>Side (LHS/RHS)</th> <th>Ownership Details</th> <th>Available Quantity</th> </tr> </thead> <tbody> <tr> <td>BA-1</td> <td>10+500</td> <td>20</td> <td>LHS</td> <td>Government</td> <td>Hill (Adequate)</td> </tr> <tr> <td>BA-2</td> <td>15+230</td> <td>20</td> <td>LHS</td> <td>Government</td> <td>Hill (Adequate)</td> </tr> <tr> <td>BA-3</td> <td>22+000</td> <td>20</td> <td>LHS</td> <td>Government</td> <td>Hill (Adequate)</td> </tr> <tr> <td>BA-4</td> <td>27+000</td> <td>20</td> <td>RHS</td> <td>Government</td> <td>Hill (Adequate)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>The CSC shall inspect every borrow area location(s) prior to approval. The CSC shall include the 'Request for Inspection' form for approving opening and restoration of borrows area from the environment and safety considerations.</li> </ul>	Borrow Area	Chainage (km)	Lead (m)	Side (LHS/RHS)	Ownership Details	Available Quantity	BA-1	10+500	20	LHS	Government	Hill (Adequate)	BA-2	15+230	20	LHS	Government	Hill (Adequate)	BA-3	22+000	20	LHS	Government	Hill (Adequate)	BA-4	27+000	20	RHS	Government	Hill (Adequate)		
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13	Selection and Management of Quarry and its Operations	<ul style="list-style-type: none"> <li>The contractor shall prepare a Quarry Management Plan, which shall include an 'assessment on use of existing quarries' and identify plans to be prepared to comply with provisions in project's ESMP, which shall be part of Quarry Management Plan to be submitted for approval of CSC. The CSC shall include the 'Request for Inspection' form for approving opening and closing of quarry area from the environmental angle (ref. <b>Appendix-2</b>).</li> <li>The contractor's Quarry Management Plan shall include <ul style="list-style-type: none"> <li>a) Existing Quarry <ul style="list-style-type: none"> <li>The Contractor's Environmental Officer shall submit a due diligence report of existing quarries compliance with respect to applicable statutory requirements, identify and measures to offset risk to the project, if any required.</li> <li>The existing quarry shall have to comply with project's ESMP such as OHS of workers, fugitive dust control measures during transportation and at stock piling, stockpile management and any other anticipated risks.</li> </ul> </li> <li>b) New quarry <ul style="list-style-type: none"> <li>The Contractor shall not open any new quarry area without obtaining Environmental Clearance (EC) from DEIAA as required under EIA notification 2006 as amended for minor</li> </ul> </li> </ul> </li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>																														



S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<p>minerals of 15th Jan, 2016 and The Mines and Minerals (Development and Regulation) Act 1957.</p> <ul style="list-style-type: none"> <li>o The contractor shall submit the quarry management plan and stipulated conditions for approval of quarry site by Mining Department along with details of approved locations for establishing quarry and crusher operations.</li> <li>o Consent to Establish (CTE) and Consent to Operate (CTO) from HPSPCB shall be obtained by the Contractor before establishment and operation of quarry/crushers, A copy of permissions should be submitted to the CSC.</li> <li>o The quarry management plan shall comply with project's ESMP such as OHS of workers, establishment of workers accommodations, waste management, fugitive dust control during transportation and at stock piling, waste water and sanitary waster from workers camps, storage of fuel, stockpile management and any other anticipated risks shall be part of Quarry Management Plan.</li> </ul>		
14	Arrangement for Construction Water	<ul style="list-style-type: none"> <li>• The contractor shall be responsible to arrange project's water demand in compliance to requisite statutory requirements. In doing so, the contractor shall assess water source availability and shall prepare a project's water budget and management plan for approval of CSC.</li> <li>• To avoid disruption/disturbance and stressing of other water sources like springs and seasonal streams used by the communities, the contractor shall submit list of fixed water sources identified for extracting water with requisite approvals, wherever required to CSC.</li> <li>• To meet daily water requirements of water, Contractor shall prepare and implement the approved water management plan in accordance with the <b>Appendix-3</b> of ESMP document.</li> <li>• The Contractor shall use ground water as a source of construction water and may set up own bore wells. Constructing new bore well shall be in compliance with the requirements of the designated State Govt. Department and/or Irrigation and Public Health Department (IPH) for ground water extraction. The contractor shall submit a copy of the permission to CSC.</li> <li>• The contractor may choose to construct water harvesting structure, wherever feasible along road to meet demand of water during construction. Prior approvals for such harvesting shall be taken and submitted to CSC.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
15	Labour Requirements and Labour Management Procedure	<ul style="list-style-type: none"> <li>• Contractor shall comply with all labour regulations of GoHP, Government of India/IFC and World Bank including the LMP of HPRIDCL and Draft code on Occupational Safety Health and working conditions code, 2019, GoI (ref. <b>Appendix-15</b>).</li> <li>• Contractor Shall prefer skilled /unskilled local labour drawn from nearby places/ region wherever feasible/extent possible, to benefit local community.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
				of HPRIDCL under the overall guidance of Project Director
16	Arrangements for Temporary Land Requirement	<ul style="list-style-type: none"> <li>Contractor shall carry out negotiations with the landowners for obtaining their consent for temporary use of lands for construction camp/ borrow areas/Debris Disposal Area etc. and honor all local rules in this regard.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
<b>CONSTRUCTION STAGE</b>				
17	Workers Orientation and Sensitization Training	<ul style="list-style-type: none"> <li>All work force of the Contractor shall be subjected to an orientation program, which familiarize them with work requirements, safety practices at work, safe distances to keep from earth moving equipment, first aid facilities, emergency response, on-site sanitation facilities and practices to be adopted, rights and privileges of workforce among others.</li> <li>The orientation shall be carried on Induction, at the start of the day for work through toolbox meetings and tailgate sessions</li> <li>Orientation shall also include concern for community safety around operational sites/areas as well,</li> <li>Orientation shall also include first aid facilities, emergency care and emergency response plan available at operational sites and at workforce camps shall be provided to all workforces.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
18	Clearing and Grubbing	<ul style="list-style-type: none"> <li>Vegetation shall be removed from the construction zone before commencement of construction. All works shall be carried out such that the damage or disruption to flora other than those identified for minimum cutting/ clearing.</li> <li>Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from CSC.</li> <li>The Contractor, under NO circumstances shall be cut or damage trees and forest reserves. Trees identified under the project shall be cut only after receiving clearance from the Forest Department and after the receipt of CSC written permission in this regard.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
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19	Stripping, Stocking and Preservation of Topsoil	<ul style="list-style-type: none"> <li>The topsoil from all areas of cutting and all areas to be permanently covered shall be stripped off to a specified depth of 150 mm and stored in stockpiles.</li> <li>The contractor shall earmark temporarily land area and/or Right of Way for storing topsoil. The locations for stock piling shall be pre-identified in consultation and with approval CSC. The contractor shall take measures to prevent generation of dust from such stockpile areas by covering or retaining soil moisture. In addition to taking erosion preventive measures, stripping activity shall not be planned or scheduled during monsoon period. Such stockpiled topsoil shall be utilized for – <ul style="list-style-type: none"> <li>To prepare surface for bioengineering measures.</li> <li>Covering all disturbed areas including borrow areas</li> <li>Dressing of slopes of road embankment</li> <li>Agricultural fields of farmers acquired temporarily land, if so desired by such landowners.</li> </ul> </li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
20	Construction Camp Site Offices, Material Stack Yards, Hot Mix Plants, Batch Mix Plants for WMM and Concrete, Workforce Camps Locations - Selection, Design and Lay-out	<ul style="list-style-type: none"> <li>Contractor's Environmental Officer and Health and Safety Officer in consultation and with requisite approvals from Gram panchayat and/or private land owners shall identify suitable lands, which can be used as material stack yards and work camp sites for establishing macadam mix plants, hot mix plants and storage of construction materials by the contractor during construction phase. The contractor shall submit to CSC the lease agreement with private/community/government owner for setting up campsites at suitable locations along road alignment and shall mandatorily restore to its previous state after completion of road construction works (ref. <b>Appendix-4</b>).</li> <li>The contractor shall submit location specific lay-out plan of all temporary establishment with details of facilities proposed for approval of CSC. No temporary establishments shall be operated without consent of CSC.</li> <li>Preferably barren lands or uncultivable lands and those away from human settlements shall be the given preference, while selecting and establishing work camp sites. Also, these shall be at least 500m distance away from forest areas and water bodies. The selected land shall not warrant significant change in landforms or terrain, to make it suitable for establishing work camp sites/store yards. In case, land had been earlier used for establishing work camp site and meets the above requirements, same shall be given preference.</li> <li>If private land (s) has been identified, no site clearing operations shall commence without a written lease agreement. The agreement with landowner shall clearly state the lease duration, compensation for the agreed lease period, site restoration plan as desired/required by the landowner and any other condition mutually agreed upon between contractor and landowner. In case agricultural land have been chosen with no alternatives, then topsoil (30-45 cm deep)</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
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		<p>shall be collected and stored in an access-controlled area and covered with net cloth. Regular sprinkling of water in pressurized fine spray shall be done to prevent blowing away of soil.</p> <ul style="list-style-type: none"> <li>• The contractor shall be responsible to provide any mitigation and management measures to prevent induced impacts from such establishment due to waste water, solid waste, landslide, erosion, clogging of streams, soil and water contamination, spoil dumping etc. Any claims or complaints arising due to contractor actions shall be addressed in amicable way at their own cost.</li> <li>• Requisite consent to establish and consent to operate shall be obtained from HPSPCB. All stipulated consent conditions by HPSPCB shall be strictly adhered and complied by contractor. The work camp sites shall be access controlled with fixed entry and exit points.</li> <li>• The dust levels at the work camps sites shall be controlled through regular sprinkling of water through similar mobile tankers deployed at operational areas for road construction. Bitumen mix plants, Batch mix plants deployed for road construction shall conform to regulatory norms/requirements.</li> <li>• The site shall be cleared from all remnants of construction and debris and site restored to its previous state, prior to handing the site to the owner.</li> <li>• The work camp sites shall mandatorily have designated paved areas with shades/roof for storage of used oils/lubes in plastic/HDPE drums, prior to their final disposal in HPSPCB approved disposal locations.</li> <li>• Provision of one mobile toilet of 2-seater capacity (1 men and 1 woman with separate entrances) shall be stationed at a suitable place within 100 meters from each operational area. The mobile toilet shall have at least 1000 liters overhead water storage, well always maintained and in usable condition. Bottom tanks shall be regularly cleaned, and overhead tank replenished as per requirement.</li> <li>• Work force shall be oriented to use mobile toilets and avoid using public toilets and/or nearby open places/parks.</li> <li>• Every operational area shall be provided with one mobile drinking water kiosk having a storage of 300 liters and placed at a suitable place within 100 meters from work site.</li> <li>• All work force shall be provided with suitable type of accommodation, if required and local labour or can return to their normal places of residence. Pooled transportation facilities as may be required, shall be provided by contractor. If establishing workforce camps become utmost necessary, then same shall be established at least 500m away from the settlement areas and away from bridge sites and or any other water body.</li> <li>• The camp site shall be restored to its previous state or as agreed upon with the landowner prior to establishing the workforce camp.</li> </ul>		

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		<ul style="list-style-type: none"> <li>The workforce camps shall be provided with all basic facilities like water supply, cooking gas facility, sanitation facilities including provision of mobile toilet (of adequate seating capacity for men and women separately) shall be stationed within the workforce camp. The mobile toilet shall be periodically replenished with fresh water for ablution purposes and waste water shall be emptied through suction tankers and carried to the nearest municipal sewage treatment facilities. Alternatively, septic tank cum soak pit arrangements of adequate capacity shall be provided as per requirements.</li> <li>No wastewater from the camp/work force site shall be discharged directly without any treatment in to any surface water channels or drain, which eventually join surface water bodies.</li> <li>The camp sites shall have 4 numbers of septic tank (each 5m Length, 2m Breadth and 1.5 m Clear depth with 0.3 free board) with soak pit arrangement which can serve for work force at peak level as per CPWD specifications.</li> </ul>																	
21	Earth / Rock excavation and Disposal of Muck/Construction Debris	<ul style="list-style-type: none"> <li>The site clearance and/or excavation activities shall be opened up only in segments of 250 m stretch at a time and no new stretches shall be opened up unless the clearance and/or excavation activities in previous stretches been satisfactorily completed and clearance given for the opening of next stretch by CSC (ref. <b>Appendix-5</b>).</li> <li>Prior to undertaking any site clearance and/or excavation activities, particularly hill side cut and excavation activities in any working stretch, the contractor shall mandatorily prepare an excavation plan with site specific measures/plans to comply with project's ESMP and C-ESMP. The contractor through 'Request for Inspection' form shall submit 'excavation plan' to CSC for approval in advance before opening of new work zone i.e., 250m for approval of CSC.</li> <li>Stability of slopes, natural and man-made, is important for a hill road. The hill cut operations during project road construction can potentially disturb the hill slopes, in addition to other causative factor like, erosion by rainfall and runoff, surcharge etc. The adverse impacts can be minimized by regulating slope cuts along the hill faces. The recommended safe cut slopes are given hereunder:  <p style="text-align: center;"><b>Recommended Slope cuts for Hillside along Project Road</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>S. No</th> <th>Type of Material</th> <th>Recommended Slope cuts</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Loose Soil and Vulnerable Geology</td> <td>2V: 1H</td> </tr> <tr> <td>2</td> <td>Compacted Soil with Slope towards Road</td> <td>4V: 1H</td> </tr> <tr> <td>3</td> <td>Soft Rock</td> <td>6V: 1H</td> </tr> <tr> <td>4</td> <td>Hard Rock</td> <td>8V: 1H</td> </tr> </tbody> </table> </li> </ul>	S. No	Type of Material	Recommended Slope cuts	1	Loose Soil and Vulnerable Geology	2V: 1H	2	Compacted Soil with Slope towards Road	4V: 1H	3	Soft Rock	6V: 1H	4	Hard Rock	8V: 1H	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
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		<ul style="list-style-type: none"> <li>Blasting and use of explosives in any form shall not be used by the contractor under any circumstances. All rock excavation/ hill cutting operations shall be carried out using the rock driller/ hammer attachments with the excavators.</li> <li>Prior to commencement of any such rock excavation operations, contractor shall inspect the site to assess the potential for any disturbance to the adjoining houses/ properties and undertake the works in slow pace with prior intimation to such property owners.</li> <li>The excavation plan shall include detail estimated volume of material to be cut or excavated, details of approved disposal sites, arrangements made for transport of excavated material to the approved disposal sites, dust suppression measures at excavation site and along transportation routes, method of stacking and/or handling the excavated material at the disposal site, health and safety measures, road safety and traffic management, slope stability and erosion and emergency response etc.</li> <li>The contractor's handling and management of surplus excavation material through a Muck Disposal Plan. The site-specific Muck Disposal Plans so prepared shall be reviewed and approved by CSC and shall be mandatory for opening and commencement of excavation or hill side cutting at new work zone or stretch.</li> <li>The site-specific Muck Disposal Plan shall essentially include <ul style="list-style-type: none"> <li>Agreement with landowner</li> <li>On a contour map record land area, boundary limits, existing and surrounding environmental settings, but not limited to topography, drainage, water bodies, settlements, trees, haul road etc. and identify likely environmental risk and safety hazards.</li> <li>The details of mitigation measures shall include both engineering (toe wall, gabion wall) and non-engineering measures (benching, nature-based bio-engineering solutions)</li> <li>Restoration plan of the muck disposal site</li> </ul> </li> <li>The construction debris from all operational areas shall be regularly scavenged and disposed off at disposal sites identified under the project or those approved by District administration. Prior to debris collection, a fine spray of water shall be sprinkled with pressurized fine spray to contain/limit dust levels at source. Following are the locations identified for disposal debris during excavation or demolition process (ref. Figure 2-5 under Section 2 of ESIA volume).</li> </ul> <table border="1"> <thead> <tr> <th>S. No.</th> <th>Location</th> <th>Type of Land</th> <th>Holding Capacity (m<sup>3</sup>) and Dimensions</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>7+900 (LHS)</td> <td>Govt/ PWD Land</td> <td>4,000m<sup>3</sup> (L=100m W=8m; H=5m)</td> </tr> <tr> <td>2</td> <td>8+900 (LHS)</td> <td>Govt/ PWD Land</td> <td>3,600m<sup>3</sup> (L=80m; W=9m; H=5m)</td> </tr> <tr> <td>3</td> <td>10+200 (LHS)</td> <td>Govt/ PWD Land</td> <td>12,000m<sup>3</sup> (L=150m W=8m; H=10m)</td> </tr> </tbody> </table>	S. No.	Location	Type of Land	Holding Capacity (m <sup>3</sup> ) and Dimensions	1	7+900 (LHS)	Govt/ PWD Land	4,000m <sup>3</sup> (L=100m W=8m; H=5m)	2	8+900 (LHS)	Govt/ PWD Land	3,600m <sup>3</sup> (L=80m; W=9m; H=5m)	3	10+200 (LHS)	Govt/ PWD Land	12,000m <sup>3</sup> (L=150m W=8m; H=10m)		
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3	10+200 (LHS)	Govt/ PWD Land	12,000m <sup>3</sup> (L=150m W=8m; H=10m)																	

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures				Responsibility	
						Planning and Execution	Supervision/ Monitoring
		4	11+000 (LHS)	Govt/ PWD Land	20,000 m <sup>3</sup> (L=200mW=10m; H=10m)		
		5	12+350 (LHS)	Govt/ PWD Land	6,300m <sup>3</sup> (L=70mW=15m; H=6m)		
			12+430 (LHS)		2,500 m <sup>3</sup> (L=50m; W=10m; H=5m)		
		6	13+800 (LHS)	Govt/ PWD Land	2,400 m <sup>3</sup> (L=40mW=10m; H=6m)		
			13+900 (LHS)		4,800m <sup>3</sup> (L=120mW=8m; H=5m)		
			14+000 (LHS)		1,600m <sup>3</sup> (L=40mW=8m; H=5m)		
		7	17+850 (LHS)	Govt/ PWD Land	50,000m <sup>3</sup> (L=80m; W=10m; H=6m)		
		8	20+100 (LHS)	Govt/ PWD Land	50,000m <sup>3</sup> (L=100mW=25m; H=6m)		
		9	25+500 (LHS)	Govt/PWD Land	2,000 m <sup>3</sup> (L=40m; W=10m; H=5m)		
		10	25+650 (LHS)	Govt/ PWD Land	2,000 m <sup>3</sup> (L=50m; W=10m; H=4m)		
		11	27+250 (LHS)	Govt/ PWD Land	4,000 m <sup>3</sup> (L=100m; W=10m; H=4m)		
		12	27+450 (LHS)	Govt/ PWD Land	2,560m <sup>3</sup> (L=80m; W=8m; H=4m)		
			27+550 (LHS)		2,800m <sup>3</sup> (L=100m; W=7m; H=4m)		
		13	27+700 (LHS)	Govt/ PWD Land	2,100m <sup>3</sup> (L=70mW=5m; H=6m)		
<b>Total holding Capacity of Muck/ Debris</b>				<b>1,72,600 m<sup>3</sup></b>			
		<ul style="list-style-type: none"> <li>Prior to disposal, the excavated material shall screen for recovery of good soil, which can be used in the construction of sub grade, shoulders, back filling of retaining/breast/toe walls and rock boulders for gabions and or any other road construction works. The use of recovered material in the project is subject to conforming to technical specification and standards prescribed for the project and approval by the CSC.</li> <li>The noise levels during excavation shall be reduced/limited through deployment of well-maintained construction vehicles/equipment/machinery. All excavation activities shall be undertaken during daytime and at normal work pace, particularly in settlement areas.</li> </ul>					
22	Accessibility	<ul style="list-style-type: none"> <li>The Contractor shall provide safe and convenient passage for vehicles, pedestrians and livestock to and from roadside and property access connecting the project road, providing temporary diversions, wherever required.</li> </ul>				Contractor	Supervision: Environment & Social Specialists of CSC

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> <li>The Contractor shall also ensure that the existing access roads shall not be disrupted without providing alternate and adequate temporary diversion provisions. After completion of the work disrupted/damaged access roads shall be restored by the Contractor.</li> </ul>		<u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
23	Planning for Traffic Diversions and Detours	<ul style="list-style-type: none"> <li>Traffic Control Plans shall be prepared by the Contractor and submitted to CSC for approval seven days prior to commencement of works on any section of road. Temporary diversions shall be constructed with the approval of the CSC and local/ district admin authorities as required (ref. <b>Appendix-6</b>).</li> <li>The traffic control plans shall include details of temporary diversions, traffic safety arrangements for construction under traffic, details of traffic arrangement after cessation of work each day, safety measures for night-time traffic and precaution for transportation of hazardous materials, among others.</li> <li>The Contractor shall ensure that the diversion/detour is always maintained in good and easily usable condition, particularly during the monsoon to avoid disruption to traffic flow.</li> <li>The Contractor shall also inform all stakeholders/local community of changes to traffic routes, conditions and pedestrian access arrangements under intimation to CSC. The temporary traffic detours shall be kept free of dust by sprinkling of water as required under specific conditions (depending on weather conditions, construction in the settlement areas and volume of traffic. Normally 3-4 times of water sprinkling per day shall suffice).</li> <li>In addition, a road safety awareness campaign including securitization about traffic noise levels shall be conducted by CSC at all the schools located along the project road. Such campaign shall be conducted first prior to commencement of road construction works at such specific stretches and/or after the installation of proposed noise barriers, as warranted.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
<b>PROCUREMENT OF CONSTRUCTION MATERIAL</b>				
24	Earth from Borrow Areas for Construction	<ul style="list-style-type: none"> <li>The location, shape and size of the designated borrow areas shall be as approved by the CSC and operated in accordance to the IRC recommended practice for borrow pits for road embankments (IRC 10: 1961). The borrowing operations shall be carried out as specified in the guidelines of project road specific ESMP (refer <b>Appendix-1</b> of ESMP document) for siting and operation of borrow areas.</li> <li>If unpaved surfaces used for the haulage of borrow materials, passing through the settlement areas or habitations, the same shall be maintained dust free by the Contractor. Sprinkling of water shall be carried out twice a day to control dust along such roads during their period of use. And clearing of the spillages, on a daily basis</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director



S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> <li>During dry seasons (winter and summer) frequency of water sprinkling shall be increased in the settlement areas and CSC shall decide frequency of sprinkling depending on the local requirements.</li> <li>Contractor shall rehabilitate the borrow areas as soon as borrowing operations are completed from a specific area is over in accordance with the approved borrow area management and redevelopment Plan.</li> </ul>		
25	Quarry Operations Crushers	<ul style="list-style-type: none"> <li>The Contractor shall source materials from quarries only after consent of the competent authorities like Department of Mining and District Administration. In view of the special situation of excavation of the hillside, Contractor shall get an opportunity to reuse the same excavated material for road construction.</li> <li>The Contractor shall have a Comprehensive Quarry Redevelopment plan, as per the HP Mineral Policy 2013/guidelines and submit a copy to CSC prior to opening of the quarry site. The quarry operations shall be undertaken within the rules and regulations in force.</li> <li>The establishment of crusher plant shall be done as per the existing guidelines (HP Mineral Policy 2013) for setting up of stone crushing units in Himachal Pradesh.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
26	Transporting Construction Materials and Haul Road Management	<ul style="list-style-type: none"> <li>Contractor shall maintain all roads (existing or built for the project), which are used to be for transporting construction materials, equipment and machinery. All vehicles delivering fine materials to the site shall be covered with tarpaulin to avoid spillage of materials.</li> <li>All roads used by vehicles of the Contractor or any of his sub-contractor or suppliers of materials and similarly roads, which are part of the project construction works, shall be kept clear of all dust/mud/spillage or extraneous materials dropped by such vehicles.</li> <li>Contractor shall arrange for regular water sprinkling as necessary for dust suppression of all such roads and surfaces. If a community/village road is to be used as a haulage road then drivers and other involved workers shall be sensitized about "How to deal with community and avoid conflicts".</li> <li>Community shall be consulted by Contractor to fix the timings of road usage and should avoid peak hours, if any to avoid/minimize inconvenience to local community.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
27	Water requirement of project and sanitation facilities	<ul style="list-style-type: none"> <li>The contractor shall not over depend on any one single source and shall identify multiple sources (at least more than one), to avoid conflict of interest between pre-existing users of water sources and the contractor. Water requirements of project are to be met from only existing tube/dug wells, with prior approval of CSC and competent authorities. Contractor shall preferably have more than one source to avoid over dependence on single source and affect pre-existing users. Contractor shall obtain prior approvals from ground water department and/</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<p>or other designated department like IPH department where required and submit a copy of the same to CSC.</p> <ul style="list-style-type: none"> <li>• Project region/area and entire Mandi district is not categorized as over exploited area and therefore contractor can even construct new tube wells specially for the water requirements of the project, if required, with requisite prior permissions/ approvals from competent authorities as required/ applicable.</li> <li>• Water for construction should not be sourced from any waterbody/source used by community for drinking purpose, but can be taken from waterbodies, which are neither used for drinking water or domestic purposes. However, before abstracting the water the contractor has to obtain written permission from the panchayat and/or from the Irrigation and Public Health Department in such cases.</li> <li>• The Contractor shall consider development of new surface water bodies at suitable places in the vicinity of the project road and or renovation of existing surface water bodies with prior permission of the village panchayat for harvesting of water during rainy season. This water can be used for construction purpose and on completion of the construction the same can be handed over to the community for maintenance and use.</li> <li>• Contractor should preferably explore/identify local depressions along the alignment in consultation with the local panchayat to be developed as water storage areas. The CMU can enter into an agreement with the panchayat for development of this water body and using the water stored on it for construction purpose.</li> <li>• The Contractor should identify suitable water sources for meeting the construction water demand including the construction of dedicated tube wells and take prior permissions for sourcing of water from competent authorities like IPH and other designated departments. Overall, as there are no major perennial surface water bodies along and/or in the vicinity of the project road, the project road construction cannot completely depend on surface water bodies and may have to largely depend on ground water sources.</li> <li>• Construction water not be sourced from any tube wells, without prior permission of the owners or the authorities or local bodies. The permission from state ground water department and/or designated department shall be obtained in case new tube wells are to be constructed;</li> <li>• Contractor shall adopt use of plasticizers/super plasticizers in concrete production to reduce water consumption. The road construction authority by itself does not involve any operations, which lead to generation of effluents/emissions that may directly or indirectly impact either surface and/or ground water resources.</li> </ul>		<p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
28	Vulnerability aspects at all Construction and Operation sites	<ul style="list-style-type: none"> <li>The overall vulnerability of Mandi district including the project road is categorized as High. In order to ensure safety of work force during any kind of natural calamity (vulnerable situation) like earthquake, landslide, flood, wind, an ERP (emergency response plan) must be prepared by contractor, which shall be duly approved by CSC. District authorities shall be consulted for their coordination, in cases of occurrence emergency/natural calamities</li> <li>All work force irrespective of levels, are to be provided with training to respond in an emergency and periodic mock drill shall be conducted to ensure the preparedness to respond any emergency situations.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
29	Occupational Safety, Health, First Aid Facilities and Documenting Safety at all Construction and Operation sites	<ul style="list-style-type: none"> <li>All labour shall be provided with safety instructions daily, depending upon the work, for which they are likely to be deployed for the day/shift. Labour shall be provided with PPEs at no cost and ensure that same is always being used by work force, while at work. In case of the damaged or lost PPEs, same shall be replaced without any cost to labour.</li> <li>All labour shall be instructed and encouraged to report, irrespective of small or major or fatal injury to the supervisory staff and all such incidents shall be documented, and ensure such incidents are not repeated by taking adequate precautions. All Supervisory staff shall be provided with mobile phones for better communication across all operational areas, in case of emergency or otherwise</li> <li>The contractor shall make available a standby vehicle for emergency purpose for transportation in case of accident with serious injuries at site. Any accident with fatalities shall be reported promptly to CSC and shall take measures to compensate the affected person in accordance with existing regulation.</li> <li>First aid facilities and free emergency care shall be provided to all workforce, irrespective of their rank/level and no cost shall be recovered from them on this account.</li> <li>The contractor shall deploy a medical practitioner periodically at camp site to attend to health issues/first aids and shall conduct regular health check-up of all staffs and workers employed in project.</li> <li>Further, no wages shall be cut for period of absence as a result of injury – The contractor shall mandatorily have Contractor All Risk (CAR) policy to cover workers of main contractor and as well as all sub-contractors and third party.</li> <li>All work site(s) shall have first aid kits and details of major/nearby hospitals displayed prominently in local language, in case of emergency and/fatalities to work force and/or public, as a consequence of operations. The supervisory staff shall be provided with wireless communication system (mobile telephones for better communication at operational area and also with other operational area, in case of emergency or otherwise.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
<b>CONSTRUCTION WORK</b>				
30	Floods, drainage including storm water management at Operational areas	<ul style="list-style-type: none"> <li>Provision of enough cross-drainage structures with adequate capacities shall reduce both the chances as well as impacts of floods. In case of seasonal streams along project road, ensure construction of RCC aprons on the upstream side of seasonal streams and channelized the water on the downstream side with protection measures to control erosion of soil, which in turn reduce floods on downstream areas.</li> <li>Project design include provision for construction of RCC/ stone boulder aprons on the upstream side along with steps with guiding walls and RCC/ stone boulder aprons on downstream side to channelize the water and dissipate energy to control the erosion and subsequently reduce floods on downstream areas. The engineering design drawings for CD structures at all locations along project road has included such required protection measures.</li> <li>The Contractor shall ensure that no construction materials like earth, stone, or are disposed off in a manner that can restrict/block the flow of drainage in and around the operational areas. Ensure that no site clearance soil/debris are dumped into the waterways prior to commencement of road construction operations and the waterways is to be periodically checked and cleaned throughout the construction phase for deposition of construction debris during construction phase and follow it up with final clean up just prior to opening of the road for traffic and handing over of road.</li> <li>Also, it needs to be ensured that no water logging occurs along road construction operational area during rainy days/ season and in turn affect the existing road users. In case of excess water logging, the same shall be emptied using dewatering pump or any other means as may be required, to ensure existing road users are not unduly affected. The contractor while providing outfall of cross drainage structure shall avoid discharging to private land or agriculture land.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
<b>POLLUTION PREVENTION</b>				
31	Water Pollution	<ul style="list-style-type: none"> <li>The Contractor shall provide oil interceptor and take pre-cautionary measures to ensure that no water pollution occurs through surface runoff from construction vehicle parking areas, fuel/lubricants storage sites, vehicle, and machinery/equipment maintenance sites.</li> <li>Contractor shall ensure that all vehicle/machinery and equipment maintenance and refueling shall be carried out in such a manner that spillage of fuel and lubricants do not contaminate soil and groundwater.</li> <li>All other off-site operational areas like camp site, work force camp sites, which are likely to have potential for pollution, are to be provided with on-site mobile sanitary facilities, the effluents/waste discharges of which shall be transported to nearest sewage treatment plants through mobile tankers.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility													
			Planning and Execution	Supervision/ Monitoring												
		<ul style="list-style-type: none"> <li>• The oil/lube storage shall be under roofed areas with impermeable cement concrete surfaces. Thus, the project operations shall not have any significant scope for soil or surface and/or ground water contamination. Thus, road construction project shall not impact ground water sources.</li> <li>• The water usage pattern within the construction camps can be minimized by adopting following best practices: <ul style="list-style-type: none"> <li>○ Use buckets for washing purposes instead of using running water.</li> <li>○ Use of auto shut off taps (without sensors) in labour accommodation.</li> <li>○ Install water meters with main supply pipes/water tanks/bore well to assess quantity of consumed water.</li> <li>○ Create awareness among the camp site, work force camp sites at all levels.</li> </ul> </li> <li>• Areas used for handling of fuel and lubricants, wherever applicable shall be impermeable surfaces and under roof to prevent groundwater and soil contamination in the event of accidental spills.</li> <li>• All other off-site operational areas like camp site, work force camp sites, which are likely to have potential for pollution, are to be provided with on-site mobile sanitary facilities, the effluents/waste discharges of which shall be transported to nearest sewage treatment plants through mobile tankers.</li> <li>• The camp site and work force camp sites shall be provided with septic tank with soak pit arrangement of adequate capacity and numbers as required.</li> <li>• All toilets and wash areas within the camp site and work force camps shall be provided with septic tanks and soak pit arrangements of adequate capacity. No wastewater from the camp/work force site shall be discharged directly into any surface water channels or drain, without any treatment, which eventually join surface water bodies.</li> <li>• Typically, each 5m Length, 2m Breadth and 1.5 m Clear depth with 0.3 free board with soak pit arrangement, which can serve up to 50 users at peak level as per CPWD specifications.</li> <li>• CPHEEO, Ministry of Housing and Urban Affairs, GoI recommended sizes of septic tank (as per BIS 2470 part I) up to 300 users are given in the following table. The number of septic tanks required at the workforce camps and camp sites can developed demanding up to the number of locations and users. BIS 2470 part I may be referred for construction details of septic tanks and soak pit disposal arrangement (ref. <b>Appendix-14</b>).</li> </ul> <p style="text-align: center;"><b>CPHEEO Recommended size of septic tank up to 300 users</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">No. of Users</th> <th rowspan="2">Length (m)</th> <th rowspan="2">Breadth (m)</th> <th colspan="2">Liquid depth (m) (cleaning interval of)</th> </tr> <tr> <th>2 years</th> <th>3 years</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	No. of Users	Length (m)	Breadth (m)	Liquid depth (m) (cleaning interval of)		2 years	3 years							
No. of Users	Length (m)	Breadth (m)				Liquid depth (m) (cleaning interval of)										
			2 years	3 years												

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures					Responsibility		
							Planning and Execution	Supervision/ Monitoring	
			5	1.5	0.75	1.0	1.05		
			10	2.0	0.90	1.0	1.40		
			15	2.0	0.90	1.3	2.00		
			20	2.3	1.10	1.3	1.80		
			50	5.0	2.00	1.0	1.24		
			100	7.5	2.65	1.0	1.24		
			150	10.0	3.00	1.0	1.24		
			200	12.0	3.30	1.0	1.24		
			300	15.0	4.00	1.0	1.24		
		<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>▪ Capacities are recommended on the assumption that discharge from only WC shall be treated in the septic tank.</li> <li>▪ Provision of 300mm should be made for free board.</li> <li>▪ Sizes of septic tank are based on certain assumption on peak discharges, as estimated in IS:2470 (part 1) and while choosing the size of septic tank exact calculations shall be made.</li> <li>▪ For users over 100, the tank may be divided into independent parallel chambers of maintenance and cleaning.</li> </ul>							
32	Air Pollution	<ul style="list-style-type: none"> <li>• The Contractor shall take every precaution to reduce the level of dust from contractor's establishment sites and/or operational construction sites involving earthwork by sprinkling of water and suppression of dust (ref. Appendix-8 for relevant standards).</li> <li>• All tipper trucks, carrying construction debris shall be covered with net cloth and wetted prior to dispatch of every trip, to prevent en-route spills as well as airborne dust during transit. Tipper trucks shall not be overloaded beyond designated capacities and shall be provided with tail board, to avoid en-route spills.</li> <li>• The dust levels during collection and loading operations of construction debris shall be controlled through periodical sprinkling of water through mobile water tankers of adequate capacity fitted with pressurized fine spray with hose reels and stationed at excavation areas.</li> <li>• The Contractor shall procure the construction plants and machinery, which shall conform to the pollution control norms specified by the MoEF&amp;CC/CPCB/HPSPCB.</li> </ul>					Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>	
33	Emission from Construction Vehicles,	<ul style="list-style-type: none"> <li>• Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of CPCB and/ Motor Vehicles Rules.</li> </ul>					Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p>	

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility													
			Planning and Execution	Supervision/ Monitoring												
	Equipment and Machineries	<ul style="list-style-type: none"> <li>The Contractor shall submit PUC certificates for all vehicles/ equipment/ machinery used for the Project.</li> <li>Environmental monitoring of all construction operational sites and contractor's establishment sites shall be conducted in frequency mentioned in Environmental Monitoring Plan of ESMP and agreed/ approved C-ESMP.</li> </ul>		<u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director												
34	Noise Pollution: Noise from Vehicles, Plants and Equipment Construction of Noise barriers at selected sensitive Receptors (Schools and Hospitals)	<p>The Contractor shall confirm to the following:</p> <ul style="list-style-type: none"> <li>All Construction plants and equipment used in construction shall strictly conform to the MoEF&amp;CC/CPCB/HPSPCB requirements with respect to emissions and noise levels/standards.</li> <li>Servicing/routine maintenance of vehicles, equipment and machinery shall be regular and up to the satisfaction of the CSC to keep emissions and noise levels as per norms/minimum.</li> <li>At the construction sites within 150 m of the nearest habitation, noisy construction works such as crushing, operation of DG sets, use of high noise generation equipment shall be stopped during the night-time between 10.00 pm to 6.00 am.</li> <li>In order to limit noise levels at some of the sensitive receptors along project road, provision for noise barriers is made at 2 locations as hereunder:</li> </ul> <table border="1" data-bbox="548 837 1478 1053"> <thead> <tr> <th>S. No</th> <th>Chainage (Km)</th> <th>Sensitive Receptors</th> <th>Mitigation Measure</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>4+770</td> <td>Saraswati Vidya Mandir Middle School</td> <td>Barrier for noise attenuation</td> </tr> <tr> <td>2</td> <td>22+230</td> <td>Unity Public School</td> <td>Barrier for noise attenuation</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>All the noise barriers shall be provided with polycarbonate sheets with 90% light transmittance fitted with polypropylene rubber gaskets and mounted on steel frames shall installed along school building, without affecting the aesthetics. Noise barriers are proposed for two schools shall be constructed in advance (prior to commencement of road construction works) at each sensitive receptor like schools, which have been identified for providing the noise control measures (Refer Section 3 for design/drawings and general arrangement of noise barrier as well as crash barriers).</li> <li>In addition, a road safety awareness campaign including sensitization about traffic noise levels shall be conducted by CSC at all the schools located along the project road. Such campaign shall be conducted first prior to commencement of road construction works at such specific stretches and/or after the installation of proposed noise barriers, as warranted.</li> </ul>	S. No	Chainage (Km)	Sensitive Receptors	Mitigation Measure	1	4+770	Saraswati Vidya Mandir Middle School	Barrier for noise attenuation	2	22+230	Unity Public School	Barrier for noise attenuation	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
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1	4+770	Saraswati Vidya Mandir Middle School	Barrier for noise attenuation													
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S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
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		<ul style="list-style-type: none"> <li>Ensure no conflicting situation develop/arise with the stakeholders along project road and local community including School authorities during the entire road construction phase through a responsive communication channels and resolve any grievances through a responsive GRM and conflict management initiatives.</li> </ul>		
35	Waste Management	<ul style="list-style-type: none"> <li>The Contractor's ESMP (C-ESMP) shall include a Waste Management Plan for Hazardous and Non-Hazardous waste prepared in accordance with requirements stipulated in (a) The Batteries (Management &amp; Handling) Rules, 2001 (b) Municipal Solid Wastes (Management and Handling) Rules, 2000, (c) Hazardous Waste (Management, Handling &amp; Transboundary Movement) Rules, 2016 and (d) Construction and Demolition Waste Management Rules, 2016. The waste management plan shall be submitted for approval of CSC (ref. <b>Appendix-12</b>).</li> <li>The camp site shall have compost pits for treating organic waste and separate bins for collecting the inorganic waste, which shall be disposed at nearest municipal disposal sites. The nearest such sites are available at Mandi.</li> <li>The contractor shall collect and store hazardous waste generated at camp sites in HDPE/steel drums and stored in a segregated roofed area and periodically disposed at approved waste disposal facilities by HPSPCB. The nearest such facility is located at Baddi Barotiwala Nalagarh Industrial Area (BBN) in the adjoining Solan District. The contractor shall also identify HPSPCB authorized recycling agency for handling used oil. The used lubes/oil and discarded batteries shall be disposed only through recyclers authorized by HPSPCB.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
<b>SAFETY</b>				
36	Occupational Health and Safety of Labours/ Work force	<ul style="list-style-type: none"> <li>The Contractor shall comply with all the precautions as required for ensuring the safety of the workmen as per the GoHP and Government of India norms/regulations</li> <li>All workforce deployed shall be governed by labour management procedures of HPRIDCL and Himachal Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, with regards to safety and welfare measures (including equal wages for men and women) for workers employed at building and other construction sites. The Contractor shall make sure that during the construction work all relevant provisions of Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, are adhered to.</li> <li>The Contractor shall not employ any person below the age of 18 years for any construction work and no woman shall be employed for hazardous work, unless and otherwise she is trained to carry put such work.</li> <li>The Contractor shall also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint. And no woman workers are involved in such work</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>



S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
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		<ul style="list-style-type: none"> <li>The Contractor shall mark 'hard hat' and 'no smoking' and other 'high risk' areas and enforce compliance to use of PPE with zero tolerance. These shall be reflected in the Construction Safety Plan to be prepared by the Contractor during mobilization and shall be approved by CSC</li> <li>The contractor shall provide to all work force deployed at work sites protective footwear, protective goggles and face masks to the workers employed in asphalt works, concrete works, crusher etc.</li> <li>The contractor shall provide welder's protective eye-shields to workers who are engaged in welding works, Earplugs to workers exposed to loud noise, and workers working in crushing or compaction.</li> <li>It shall be made mandatory to wear PPEs at work site. The PPEs shall be provided at no cost to workforce and shall be replaced once in three months. Any damaged/lost PPEs shall be replaced with no cost to workforce.</li> <li>To promote and encourage a Safety culture, senior most engineers in Contractors and consultants' teams shall wear helmets and safety jackets at all operational sites.</li> <li>Visitors/officials to work sites are to be provided with PPEs (hard hats and safety shoes) and shall be briefed ongoing operations on that specific time and related safety requirement at work site including safe distances to keep during the site visit.</li> <li>Work force shall be subjected only to standard work shifts/hours. Overtime allowances, if applicable/warranted shall be paid with ceiling limits. Working beyond such ceiling limits shall be discouraged, even if, so desired workforce or contractor.</li> </ul>		
37	Traffic and Safety	<ul style="list-style-type: none"> <li>Ensure, traffic diversions are in place, to minimize the inconvenience to the existing road users during the road construction phase. Wherever required, adequate number of uniformed traffic wardens with reflective batons shall be deployed to manage the traffic for the entire construction phase.</li> <li>Road construction schedule near sensitive receptors like schools and hospitals shall be informed to the concerned authorities well in advance. All works near sensitive receptors shall be well planned and works shall be completed in shortest possible time, with minimal inconvenience to users of sensitive receptors locations. If warranted, steel barricades shall be used to minimize the inconvenience to the road users as well as occupants of the sensitive receptors.</li> <li>Adequate traffic diversions near sensitive receptors shall be planned with adequate number of uniformed traffic wardens with reflective batons shall be deployed to manage the traffic, to ensure safety and minimal inconvenience to users of sensitive receptors location.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> <li>Noise mitigation measures such as construction of noise barriers etc. shall be constructed for the identified sensitive receptors, well in advance of commencement of road construction works.</li> <li>Dust suppression measures like regular sprinkling of water shall be carried out with more precaution near sensitive receptors to ensure dust levels kept to minimum. The construction debris and spills cleared of all construction debris daily near sensitive receptors.</li> <li>While undertaking, road construction works near the natural water bodies and/or water sources along the project road, steel barricades shall be used to completely avoid trespassing of the construction labour and to avoid/prevent spills of the construction waste (solid or liquid) into the water body.</li> <li>Extreme care shall be taken to ensure that no damage occurs to such natural water bodies and/or water sources along the project road due to the road construction works. All work forces shall be specifically oriented to strictly follow these instructions.</li> </ul>		
38	Information Signage and Hoardings	<ul style="list-style-type: none"> <li>The Contractor shall provide, erect and maintain informatory /safety signs, hoardings written in English and local language (Hindi), wherever required or suggested by CSC.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
39	Risk from Electrical Equipment(s)	<p>The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that -</p> <ul style="list-style-type: none"> <li>No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public.</li> <li>All necessary fencing and lights shall be provided to protect the public in construction zones.</li> <li>All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected and properly maintained as per IS provision and to the satisfaction of CSC.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
40	Construction activity near water bodies and/or bridge construction sites along Project Road	<ul style="list-style-type: none"> <li>Schedule all construction activities at/along waterfront areas to dry or non-monsoon seasons, particularly excavation works and casting of concrete structures/works</li> <li>Identify, minimize, and demarcate the areas earmarked for construction activities with barricades</li> <li>Cordon-off and regulate the entry and exit points for workforce /construction labour for work sites. No workforce shall enter the waterfront area unless it is warranted for construction works and same shall have prior authorized permission</li> <li>No construction related establishments like concrete batching plants, labour/workforce camps/material stack yards parking and vehicle servicing areas shall be established within 500 meters of the waterfront areas</li> <li>All construction related establishments shall have adequate drainage facilities and potential contaminant areas shall have covered roofs and/or provided with segregated drainage systems, which shall have pre-treatment units like oil/grease separator, settling tanks, prior to its discharge. No untreated waste shall be disposed-off into any natural water streams /channels under any circumstances</li> <li>All construction and operational areas shall be scavenged for clearing of any material spills daily, prior to monsoon and after the completion of work. All construction sites near waterfront shall be maintained in a clean and tidy at all times during construction phase and completely cleared off from waterfront area, prior to monsoon.</li> <li>All hazardous waste materials from operational and vehicle servicing areas shall be collected, stored under roof areas and safely disposed-off as per state pollution control broad norms</li> <li>All the workforce at construction related establishment sites shall be provided with adequate water, sanitation facilities.</li> <li>The worksites, specifically near the waterfront shall have provision for mobile toilets of at least one mobile toilet of 2-seater capacity (1 men and 1 woman with separate entrances) is stationed at a suitable place, within 100 meters from each operational area. The mobile toilet shall have at least 1000 liters overhead water storage, well always maintained and in usable condition. Bottom tanks of mobile toilets shall be regularly cleaned, and overhead tank replenished as per requirement.</li> <li>Work force shall be oriented to use mobile toilets and avoid using nearby open places/waterfront.</li> <li>Every operational area shall be provided with one mobile drinking water kiosk having a storage of 300 liters and placed at a suitable place within 100 meters from work site</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> <li>All workforce deployed near waterfront shall be adequately oriented during induction and thereafter at daily briefing/toolbox talks about safety procedures and requirements particularly when working near waterbodies/waterfronts and provided with appropriate safety gear including retro-reflective jackets at worksite</li> <li>Worksites near the waterfront shall have provision for lifesaving jackets and ropes (at least 2 sets each) placed at an easily accessible location(s) near waterfront for rescue operations, in case of any accidental falls of workforce into water. The same shall be extended and maintained even for the operation phase of the passenger berths.</li> <li>Ensure no waste of any form is dumped or construction material or waste/debris spills into water body during the entire construction works near waterfront. All such waste materials/spills during construction shall be immediately cleared off to ensure no impacts on water quality.</li> <li>The channel bed on the upstream and downstream sides of the water body up to 500m shall be cleaned up for any construction debris/ waste spills etc. prior to onset of monsoon and before demobilization of construction works/ activities from such sites.</li> <li>The Contractor shall clear all temporary structures; dispose all garbage, night soils and POL (Petroleum, Oil and Lubricants) wastes as per Comprehensive Waste Management Plan and as approved by CSC.</li> </ul>		
<b>MITIGATION MEASURES SPECIFIC TO <u>ASSOCIATED FACILITIES</u></b>				
41	Mitigation measures specific to <u>Associated Facilities</u>	<ul style="list-style-type: none"> <li>HPRIDCL has no direct control over the construction contracts of 4 bridges, which are awarded by HPPWD through funding from the Central Road Fund (CRF) of Govt. of India and presently at the different stages of completion (50-60%). Consultations with the concerned PWD division responsible for these bridges have informed that the respective contract clauses of these bridges do not include any specific environmental mitigation measures other than those which are generally deemed to be covered as incidental to civil works. Photographs of the bridge construction sites are given in Figure 7-1 &amp; 7-2 of Section 7 of ESIA volume, which clearly warrant mitigation measures to minimize/ avoid impacts due to bridge construction at respective sites.</li> <li>Since, these bridges, being integral to the project road and are considered to be the Associated Facilities, the following mitigation measures shall be undertaken by the contractor and implemented under the supervision of CSC. <ul style="list-style-type: none"> <li>Ensure no concrete batching plants, camp sites, material stack sites, vehicle servicing areas for the project road construction works will be established along river/ stream beds at these locations of Associated Facilities.</li> </ul> </li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> <li>○ Undertake cleaning the river/ stream bed on both upstream and downstream sides (up to 500 meters) and remove all construction debris and/or remnants of construction works undertaken/ completed by HPPWD contractors at all 4 bridge locations.</li> <li>○ Check and undertake bed profile correction of the river/ streams, if warranted or utmost necessary, to match it natural bed profile beyond 500 meters on both upstream and downstream sides to ensure a smooth flow regime, without localized and uneven depressions on waterfront/waterway/ stream beds.</li> <li>○ Check and repair and/or restore the eroded or damaged river/ stream banks (on both sides) up to 500 meters on both upstream and downstream sides at each of the 4 locations of Associated Facilities.</li> <li>○ Assess and identify appropriate bio-engineering (nature-based solutions) solutions, which can be undertaken along the river/ stream banks as a bank protection measures at Associated Facility locations.</li> </ul>		
<b>BIO-DIVERSITY MANAGEMENT</b>				
42	Construction activity along/ near forest stretches of Project Road	<p>The project road has forest areas adjacent to the right of way at eight stretches of project road, over a cumulative length of 4.255 km (ref. 4.5.2 &amp; Table 4.18 under Section 4- Baseline Data of ESIA volume). During construction phase contractor shall adhere to the following:</p> <ul style="list-style-type: none"> <li>• All road construction activities shall be restricted to existing right of way and forest area shall NOT be disturbed/trespassed for whatsoever reasons</li> <li>• NO trees within forest areas shall be disturbed, felled and/or lopped for movement of construction machinery or establishing working area within the right of way</li> <li>• NO dumping of construction debris shall be done in forest area</li> <li>• NO borrowing of earth shall be carried out from forests areas</li> <li>• All road construction work along the forest stretches shall be supervised so that NO workforce shall do any kind of damage to forests areas.</li> <li>• NO workforce shall enter the forests areas, for whatsoever reason</li> <li>• All workforces shall be strictly instructed to not to harm any wild animals, In case of sighting of any kind wild animals. Workforce shall be strictly instructed NOT to panic and walk away from the scene without disturbing the wild animals</li> <li>• All types of road construction work along forest stretches shall be limited to day light hours only and NO workforce shall remain in forests stretches after daylight hours.</li> <li>• Workforce shall be strictly barred from lighting of fire for whatsoever reason and use or carry inflammable materials along forest stretches.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> <li>The Contractor shall clear all temporary structures; dispose all garbage, night soils and POL (Petroleum, Oil and Lubricants) wastes as per Comprehensive Waste Management Plan and as approved by CSC.</li> </ul>		
43	Bio-diversity Management (flora and fauna)	<ul style="list-style-type: none"> <li>In order to compensate for the vegetation cleared and trees felled within right of way due to the road construction, compensatory plantation to be undertaken through planting at least 3 saplings for every tree cut with 90% survival rate with three years maintenance.</li> <li>Normally, such plantation work is taken up either along the project corridor or at places identified by the department of forests, GoHP in order to compensate for the trees felled.</li> <li>With this compensatory plantation measures, the tree cover lost could be regained in 5 to 7 years and thus the impacts could get mitigated. Only local species, which are less water consuming and approved by the forest department shall be used for plantation.</li> <li>Normally, all such afforestation shall be undertaken by the department of forest and maintained for three years as a deposit work accordingly cost provisions for compensatory plantation is included in ESMP Budget.</li> <li>In order to limit the propagation of invasive species within RoW, firstly all such invasive species within the corridor of impact and/or right of way shall be removed/cleared and replanted with local species. The department of forests, GoHP has framed a procedure for removal of invasive species and replanting of local species, which shall be duly followed. Normally, all such activities shall be undertaken by the department of forest and maintained for three years as a deposit work. Therefore, cost provision for corridor plantation is included in ESMP Budget.</li> <li>ESMP also include cost provisions for plantation and/or landscaping through nature based (bio-engineering solutions) of reclaimed low-lying areas within RoW to improve the aesthetics of road corridor.</li> </ul> <p>In order to limit the impacts on the fauna due to the road construction, the following measures shall be followed:</p> <ul style="list-style-type: none"> <li>HPRIDCL has commissioned an independent Bio-Diversity Management Study and evolve measures to manage the human-animal conflicts, (particularly Leopard) for all project corridors under Tranche I, which include this project road. The recommendations of the bio-diversity management plan shall be duly implemented by HPRIDCL.</li> <li>In addition, all culverts along 8 forest stretches of the project road (Table 4-18 of ESIA volume) and /or any other potential locations/stretch as recommended by bio-diversity study shall be adequately sized, to serve as animal crossing points and wildlife management measures thereof.</li> <li>As part of ESIA, renovation/conservation of natural water source at Km 18 has been included for conservation and rehabilitation with provision for adequate storage tanks with taps for use</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
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		<p>by local community/road users and provision of water troughs to facilitate drinking of water by wild animals, grazing and stary cattle. In addition, 5 natural water sources are also being conserved/renovated as part of enhancement measure under ESIA, out of which 3 are in rural settings, which can probably serve as water sources for wild animals, grazing and stary cattle. Design/drawings for conservation and enhancement of water sources along with adequate budgetary provisions have been included under Section 8.</p> <ul style="list-style-type: none"> <li>• All work force shall be oriented to keep calm and walk away from the scene, in case, wild animals are sighted either during work hours at operational/work sites or at night hours at campsites.</li> <li>• The construction work shall be restricted to day hours only, while working established in the vicinity/nearby forest areas and work shall not be carried out in the late evening hours/night hours /early mornings</li> <li>• Work force shall be strictly instructed not to harm/kill and prohibited hunting of wild animals under any circumstances</li> <li>• The Work force shall be strictly prohibited from entering into forest areas under any circumstances.</li> <li>• The Construction camp and work force camp sites shall not be established in the vicinity/nearby forest areas. At least 500m distance shall be kept from such areas under unavoidable circumstances.</li> <li>• The camp sites and work force camps shall be access controlled and well-lit to avoid/prevent entry of wild animals.</li> <li>• The work force shall be oriented not to feed monkeys and /or stray animals and to properly collect waste food in dustbins to prevent menace in camp area.</li> <li>• HPRIDCL shall implement all recommendations of an independent study to manage the human-animal conflicts, (particularly Leopard) for all roads under HPSRTP. The study is presently under progress and the study findings and recommendations is likely to be available by April 2021.</li> </ul>		
44	Ancient and Historical Monuments and Chance Finds	<ul style="list-style-type: none"> <li>• Project road corridor does not have any protected Ancient and Historical Monuments and therefore no measures are warranted. Hence, deployment of cultural heritage expert by HPRIDCL may not be warranted.</li> <li>• All fossils, coins, articles of value of antiquity, structures and other remains or archaeological interest discovered on the site (chance finds) shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
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		<ul style="list-style-type: none"> <li>The Contractor shall take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. The matter shall be immediately brought to CSC upon discovery of any such articles thereof and carry out the CSC instructions for dealing the same and till such time all work shall be stopped.</li> <li>The CSC shall report the matter to competent authorities at state or Archaeological Survey of India (ASI) through HPRIDCL and no further work shall be undertaken, until the location is cleared by competent authorities. Contractor shall recommence the work in the site, only after site is cleared and getting instructions from HPRIDCL through CSC.</li> </ul>		of HPRIDCL under the overall guidance of Project Director
45	Culture/ Heritage/ Places of Religious Importance	<ul style="list-style-type: none"> <li>Rewalsar has 4 monasteries, 1 gurudwara and 3 temples, sacred Rewalsar lake, all of which attract tourists from various parts of the states as well as country and several religious gatherings occurs in many months of the year. Hence, contractor shall exercise the following with utmost care.</li> <li>Ensure, traffic diversions are in place, to minimize the inconvenience to the existing road users during the road construction phase with particular religious visitors to Rewalsar. Wherever required, adequate number of uniformed traffic wardens with reflective batons shall be deployed to manage the traffic for the entire construction phase.</li> <li>Road construction schedule near Rewalsar shall be informed to the concerned authorities of monasteries, gurudwara and temples well in advance and avoid major construction works on religious/ auspicious dates at Rewalsar, to minimize inconvenience to religious visitors.</li> <li>All works between Ch. 21+000 to 23+000 near Rewalsar shall be well planned and works shall be completed in shortest possible time, with minimal inconvenience to community and tourist/ visitors. If warranted, steel barricades shall be used to minimize the inconvenience at these locations.</li> <li>Adequate traffic diversions near Rewalsar shall be planned with adequate number of uniformed traffic wardens with reflective batons shall be deployed to manage the traffic, to ensure safety and minimal inconvenience to users of sensitive receptors location.</li> <li>Dust suppression measures like regular sprinkling of water shall be carried out with more precaution near Rewalsar to ensure dust levels kept to minimum. The construction debris and spills cleared of all construction debris on a daily basis near Rewalsar.</li> <li>All work force shall be specifically oriented to strictly not to enter the lake area or feed the fishes and not to catch fish or do fishing of any type at Rewalsar lake.</li> <li>The Construction camp and work force camp sites shall not be established in the vicinity/nearby of the Rewalsar.</li> <li>The work force shall be oriented not to feed monkeys and /or stray animals</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>



S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
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		<ul style="list-style-type: none"> <li>Ensure no conflicting situation develop/arise with the local community/stakeholders and concerned authorities of monasteries, gurudwara and temples during the entire road construction phase through a responsive communication channels and resolve any grievances through a responsive GRM and conflict management initiatives.</li> </ul>		
46	Environmental Monitoring	<ul style="list-style-type: none"> <li>The Contractor shall undertake monthly monitoring of air, water, noise and soil quality covering all operational sites as well as establishment sites such as workforce camps, camp sites, crusher unit, hot mix plant among others, through an NABL accredited laboratory.</li> <li>The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored shall be as per the environmental monitoring program along with cost provisions are included in section 5 &amp; 8.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
47	Continuous Community Participation	<ul style="list-style-type: none"> <li>The contractor and CSC shall have an ongoing shall have continuous interactions with local community along project road through periodic interactions and ensure that the construction activities are not causing undue inconvenience to the locals residing in the vicinity of project road either due to movement of construction vehicles, traffic diversions, vibration, dust and noise levels due to construction works or due to handling of construction debris etc. The stakeholder's engagement plan shall be followed for community participation procedures.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
<b>CONTRACTOR'S DEMOBILIZATION</b>				
48	Clean-up Operations, Restoration and Rehabilitation	<ul style="list-style-type: none"> <li>Contractor shall prepare 'Site Restoration Plans', which shall be approved by CSC. The clean-up and restoration operations are to be implemented by the Contractor prior to demobilization.</li> <li>The Contractor shall clear all temporary structures; dispose all garbage, night soils and POL (Petroleum, Oil and Lubricants) wastes as per Comprehensive Waste Management Plan and as approved by CSC.</li> <li>All establishments' sites like camp sites, workforce campsites, hot mix plants, batch mix plants for WMM and concrete, crusher units, borrow areas, muck disposal sites have to be restored as per restoration plan approved by CSC</li> <li>All disposal pits or trenches shall be filled in and effectively sealed off. Residual topsoil, if any shall be distributed (in a layer of 30 mm) on restored sites, adjoining/ proximate barren land or areas identified by the Contractor and approved by the CSC.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director

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		<ul style="list-style-type: none"> <li>All construction zones and facilities including culverts, road-side areas, camps, Hot Mix plant sites, Crushers, batching plant sites and any other area used/affected due to the project operations shall be left clean and tidy, at the Contractor's expense and restored to previous state or to the entire satisfaction of CSC.</li> </ul>																																																														
<b>OTHER SPECIFIC CONSERVATION/RENOVATION AND ENHANCEMENT MEASURES FOR NATURAL AND CULTURAL HERITAGE RESOURCES</b>																																																																
49	Specific conservation/renovation /enhancement measures for Natural Resources and Cultural heritage Resources along Project Road	<ul style="list-style-type: none"> <li>ESMP include provisions for some site-specific conservation and enhancement measures along project road. The summary details are given in Figures 3-2 to 3-20 and summarized hereunder:</li> </ul> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Chainage</th> <th>Typology of Structure</th> </tr> </thead> <tbody> <tr><td>1</td><td>3+700</td><td>Natural Water Source (all season)</td></tr> <tr><td>2</td><td>3+999</td><td>Religious Shrine</td></tr> <tr><td>3</td><td>4+297</td><td>Dug well</td></tr> <tr><td>4</td><td>4+515</td><td>Primary health Centre</td></tr> <tr><td>5</td><td>4+773</td><td>Private School</td></tr> <tr><td>6</td><td>5+321</td><td>Religious Shrine/structure (Peepal tree with platform)</td></tr> <tr><td>7</td><td>5+989</td><td>Religious Shrine for Relocation</td></tr> <tr><td>8</td><td>8+275</td><td>Religious Shrine/structure (Peepal tree with platform)</td></tr> <tr><td>9</td><td>8+280</td><td>Natural drinking resource</td></tr> <tr><td>10</td><td>10+416</td><td>Natural water resource</td></tr> <tr><td>11</td><td>10+725</td><td>Religious Shrine</td></tr> <tr><td>12</td><td>12+482</td><td>Natural water resource</td></tr> <tr><td>13</td><td>18+048</td><td>Natural drinking water resource (all season)</td></tr> <tr><td>14</td><td>22+545</td><td>School</td></tr> <tr><td>15</td><td>22+997</td><td>Religious Shrine/structure (Peepal tree with platform)</td></tr> <tr><td>16</td><td>24+218</td><td>Religious Shrine/Structure</td></tr> <tr><td>17</td><td>24+734</td><td>Peepal tree and shrine platform</td></tr> <tr><td>18</td><td>28+216</td><td>Small Temple (Lakhdata Peer)</td></tr> <tr><td>19</td><td>28+415</td><td>Religious Shrine/structure (Peepal tree with platform)</td></tr> </tbody> </table>	Sl. No.	Chainage	Typology of Structure	1	3+700	Natural Water Source (all season)	2	3+999	Religious Shrine	3	4+297	Dug well	4	4+515	Primary health Centre	5	4+773	Private School	6	5+321	Religious Shrine/structure (Peepal tree with platform)	7	5+989	Religious Shrine for Relocation	8	8+275	Religious Shrine/structure (Peepal tree with platform)	9	8+280	Natural drinking resource	10	10+416	Natural water resource	11	10+725	Religious Shrine	12	12+482	Natural water resource	13	18+048	Natural drinking water resource (all season)	14	22+545	School	15	22+997	Religious Shrine/structure (Peepal tree with platform)	16	24+218	Religious Shrine/Structure	17	24+734	Peepal tree and shrine platform	18	28+216	Small Temple (Lakhdata Peer)	19	28+415	Religious Shrine/structure (Peepal tree with platform)	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
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50	Monitoring Operation Performance During Defect Liability Period and	<ul style="list-style-type: none"> <li>The CSC shall monitor the operational performance of the various mitigation/ enhancement measures carried out as a part of the maintenance of project road, after completion of widening/upgradation</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p>																																																												

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	subsequently by O & M Contractor	<ul style="list-style-type: none"> <li>The indicators monitoring include the survival rate of trees, nature-based bio-engineering interventions, improved air quality, reduced noise levels, status of rehabilitation of borrow areas/restored establishment sites, and effectiveness of noise barriers, among others.</li> </ul>		<u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
51	Maintenance of Drainage	<ul style="list-style-type: none"> <li>HPRIDCL shall ensure that all drains (side drains and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
52	Environmental Monitoring	<ul style="list-style-type: none"> <li>The periodic environmental monitoring parameters including ambient air quality, noise level, water quality (both ground and surface waters), soil quality in the selected locations as suggested in environmental monitoring plan (Section 5), which shall be carried out through NABL accredited laboratory. The applicable standards are given in <b>Appendix-8</b>.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
53	Soil Erosion and Monitoring of Borrow Areas	<ul style="list-style-type: none"> <li>Visual monitoring and inspection of soil erosion at borrow areas, quarries (if closed and rehabilitated), embankments and other places expected to be affected, shall be carried out once in every three months as suggested in monitoring plan (ref. <b>Appendix-10</b>).</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
54	Changes in Land Use Pattern	<ul style="list-style-type: none"> <li>Necessary hoardings shall be erected indicating the RoW boundaries and legal actions and fines for encroachment of RoW. Budgetary provisions are to be made to surveillance and control of encroachment of right of way.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC

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			Planning and Execution	Supervision/ Monitoring
				<u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
55	Public awareness on Noise levels and Health Affects	<ul style="list-style-type: none"> <li>Community at large shall be advised to construct the noise barriers such as walls, double glazed windows and tree plantation between the roads and their property. Creating Public awareness is necessary to safeguards community health along project roads due to increased traffic levels through the dissemination of information by consultations, and distribution of pamphlets during the operation stage.</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
<b>Environment and Social Management Plan – Social Impacts Mitigation Action Plan during Construction Stage</b>				
56	Loss of land due to landslides resulting from hill cutting activities	<ul style="list-style-type: none"> <li>Assessment of loss through joint survey with CSC &amp; NGO, revenue/district administration officials and others, as may be required on a case-by-case basis and due payment of compensation to title or non-title holder as per RPF provisions (in terms of rate determined and valuation done).</li> </ul>	Contractor and NGO for RAP implementation assisted by Revenue Department as required	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
57	Cracks in structures or damage due to construction works e.g., hill cutting activities and/or movement of heavy construction machinery and or due to vibrations caused thereof	<p>Advance notice to community on road construction activity. The notice shall be served through posters and leaflet and physical communications as required.</p> <p>Process to be followed shall involve:</p> <ul style="list-style-type: none"> <li>• If the structure is partially damaged and if found unviable for habitation, which shall lead to full demolition of structure. Such cases shall be compensated for full structure without depreciation as per RPF provisions</li> <li>• Compensation to structure owner as per RPF provisions if full structure damaged</li> <li>• In case of partial damage and viable for habitation, such cases be compensated for part structure and compensation shall be liberal but as per RPF provisions without any depreciation</li> <li>• Loss estimation shall be done as per latest BSR without depreciation. Labor charges etc. should be top up for estimated damage cost. The compensation amount may be paid to the affected person/family or the contractor shall arrange and pay for complete rectification of the structure to the satisfaction of the affected person.</li> <li>• Each such individual case should be documented with photographs/videography etc.</li> </ul>	Contractor and NGO for RAP implementation assisted by Revenue Department as required	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
58	Disruption in services due to shifting of utilities such as water supply, transformers, HT/LT lines, electric poles, telephone poles etc	<ul style="list-style-type: none"> <li>• Advance information (7 days) shall be served through poster and leaflet or through personal communication (as may be required) to the likely affected people/community and make alternate arrangements for the disruption periods if it is likely to be more than 8 hours.</li> <li>• Restore the services within 10 days of effect. Provide alternative source of supply for intervening period.</li> </ul>	Contractor assisted by line departments.	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>
59	Disruption to access from houses and shops to roads	<ul style="list-style-type: none"> <li>• Advance information (7 days) shall be served through poster and leaflet or through personal communication (as may be required) to the likely affected household/shops/people/community/ tourist operators.</li> <li>• make alternate arrangements for the disruption period if it is likely to be more than 8 hours.</li> <li>• Restore permanent access equal or better than previous state.</li> </ul>	Contractor	<p><u>Supervision:</u> Environment &amp; Social Specialists of CSC</p> <p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
				overall guidance of Project Director
60	Differential impacts on vulnerable and disadvantaged population	<ul style="list-style-type: none"> <li>Advance information (7 days) shall be served through poster and leaflet or through personal communication (as may be required) to the likely affected household/shops/people/community</li> <li>make alternate arrangements for the disruption period if it is likely to be more than 8 hours.</li> <li>Restore permanent access equal or better than previous state.</li> <li>Impacted disadvantaged population shall be treated case by case basis by provision of temporary access and other assistance as identified as per RPF provisions</li> </ul>	NGO for RAP implementation assisted by Revenue Department as required	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
61	Dust emissions during construction leading to impacts on crops and trees	<ul style="list-style-type: none"> <li>Advance information (7 days) shall be served through poster and leaflet or through personal communication (as may be required) to the likely affected farmers/households/people/community</li> <li>Monitor for visible dust levels through EHS officer of Contractor</li> <li>Initiate precautionary measures for dust control like periodic water sprinkling at predetermined frequency and controlled movement of construction vehicles and machinery</li> <li>Keep communication channels open with community and redress their grievances at earliest possible time in a reasonable manner and/acceptable to CSC</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
62	Likelihood of increased accidents due to road widening (including at sensitive receptor locations such as schools, hospitals)	<ul style="list-style-type: none"> <li>Adequate road signage/road marking/rumble strip/glow sign board to be provided.</li> <li>Barricading the construction area and with LED lighting facility at night hours</li> <li>Adequate traffic diversion</li> <li>Community level consultations including school authorities as well as school children</li> <li>Prior intimation in school and communities living in the vicinity adopting for safety measures</li> <li>Plan and swiftly complete the construction work in settlements areas and near sensitive receptors</li> <li>Ensure the construction work near settlements areas and sensitive receptor locations have adequate measures to ensure community safety</li> </ul>	Contractor	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director
63	Possibility of GBV (gender-based)	<ul style="list-style-type: none"> <li>To address this, contractor shall prepare a GBV Risk Mitigation Strategy in accordance with GBV risk Mitigation Strategy of HPRIDCL and it shall comprise: -</li> </ul>	Contractor and NGO for RAP implementation	<u>Supervision:</u> Environment & Social Specialists of CSC

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
	violence) arising due to influx of migrant labour/construction workers	<ul style="list-style-type: none"> <li>• Creating awareness about GBV related issues among workers during engagement and/or during Induction and signing of Code of Conduct for GBV related issues wither at workforce camps and or community hotspots like nearby market areas frequented by workers after work hours and/or weekly off days, schools, vocational training centers, liquor shops and, migrant workers residing in rented accommodations within the villages/settlement areas</li> <li>• Integrate briefings on GBV into existing IEC strategy/materials, GRM, induction training, safety talks, toolbox meetings, tailgate sessions and regular trainings.</li> <li>• Mapping of service providers for GBV prevention including surveillance at hot spots and closely monitor throughout the project cycle.</li> <li>• Prepare and Implement Labour Influx Management Plan by Contractor – This shall be prepared by contractor prior to commencement of civil works</li> <li>• Create awareness of labor supplier contractor in all labour laws, GBV risks and mitigation strategy as part of contractor’s LMP</li> <li>• The GBV risk mitigation plan shall also include: <ul style="list-style-type: none"> <li>○ Awareness programmes on GBV in communities: Since the GBV consultations during ESIA highlight that most of the women are illiterate and have no knowledge of GBV, awareness programmes like nukad natak and pictorial posters should be developed for raising community awareness on GBV prevention and response.</li> <li>○ Linkages with the police: The GBV consultations during ESIA noted that there were some reported cases of IPV and of GBV due to labour influx, which were resolved with the help of the police. The contractor/ CSC/ CMU needs to organize some local events linking the police with the community for effective redressal of incidents.</li> <li>○ Monthly meetings with women: Since the consultations noted that there are no MMs or SHGs in the villages, monthly meetings should be organized with the support of the panchayat and /or frontline workers (like the Anganwadi or Asha workers) for discussing these issues and sharing information. Since a majority of the women reported being very busy with household chores, particularly due to fetching water for drinking and domestic use, meetings should be organized taking into consideration their convenience.</li> <li>○ Multiple channels for grievance redressal need to be identified for reporting and response of GBV incidents.</li> </ul> </li> </ul>		<p><u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director</p>

S. No	Project Stage/Activity	Mitigation Management Measures/GIIP Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
64	Likelihood of spread of HIV/AIDS among construction workers and roadside community	<ul style="list-style-type: none"> <li>• Coordinate with State AIDS control society for dissemination materials amongst construction workers including creating awareness, education and Program convergence</li> <li>• Make provisions for availability of condoms at convenient locations including installation of condom vending machines at labour camp, community-based meetings, consultations in camp, distribution of leaf let, IEC communication, posters, banners</li> </ul>	Contractor and NGO for RAP implementation	<u>Supervision:</u> Environment & Social Specialists of CSC  <u>Monitoring:</u> Environmental Specialist of HPRIDCL under the overall guidance of Project Director



## 5. ENVIRONMENTAL MONITORING PROGRAMME

### 5.1 General

40. The monitoring and evaluation are critical activities in implementation of the Project Monitoring involve periodic checking to ascertain whether activities are going according to plan or not. It provides the necessary feedback for project management to ensure that the project objectives are met and on schedule.

41. The reporting system is based on accountability to ensure that the environmental mitigation measures are implemented.

42. Environmental monitoring program has the underlying objective to ensure that the intended environmental mitigations are realized and these results in desired benefits to the target population causing minimal deterioration to the environmental parameters. Such program targets proper implementation of the ESMP.

43. The broad objectives are:

- To evaluate the performance of mitigation measures proposed in the ESMP.
- To evaluate the adequacy of environmental assessment.
- To suggest ongoing improvements in management plan based on the monitoring and to devise fresh monitoring based on the improved ESMP.
- To enhance environmental quality through proper implementation of suggested mitigation measures.
- To meet the requirements of the existing environmental regulatory framework and community obligations.

### 5.2 Performance Indicators

44. Environmental components identified of significance in affecting the environment at critical locations have been suggested as performance indicators (PIs). For example, near the construction site, a thick layer of dust over the nearby vegetation/leaf is an indication that the dust control measures are not effective. The performance indicators shall be evaluated under three heads as;

- Environmental condition indicators to determine efficacy of environmental management measures in control of air, noise, water and soil pollution.
- Environmental management indicators to determine compliance with the suggested environmental management measures.
- Operational performance indicators have also been devised to determine efficacy and utility of the proposed mitigation measures.

45. The performance indicators and monitoring plans prepared for the Mandi-Rewalsar-Kalkhar road are presented in **Table 5-1**. Details of the performance indicative parameters for each of the component have to be identified and reported during all stages of the implementation.

**Table 5-1: Performance Indicators for Project Road**

S No.	Description of Item	Indicator	Stage	Responsibility
1	<ul style="list-style-type: none"><li>• No. of Borrow Areas identified and verified</li><li>• No. of sites for which Restoration Plans have been prepared</li></ul>	Borrow Area and Quarries	Pre-Construction	Contractor

S No.	Description of Item	Indicator	Stage	Responsibility
	<ul style="list-style-type: none"> <li>No. of Site Restored and Rehabilitated</li> <li>No. of Sites handed over</li> </ul>			
2	<ul style="list-style-type: none"> <li>No. of Quarry Areas identified &amp; verified</li> <li>No. of sites Restoration Plans are required and have been prepared</li> <li>No. of Site Restored and Rehabilitated</li> <li>No. of Sites handed over</li> </ul>	Borrow Area and Quarries	Pre-Construction	Contractor
3	Quantity of Debris and Spoils to be disposed off <ul style="list-style-type: none"> <li>No. of locations Approved for Debris disposal</li> <li>Quantity disposed off at each location</li> <li>No. of locations for which Rehabilitation works have been completed</li> </ul>	Disposal sites	Construction	Contractor
4	<ul style="list-style-type: none"> <li>No. of location/s identified for the Construction camp and Construction Plant sites</li> <li>No. of location/s approved</li> <li>Lay-out/s Approved</li> <li>No. of sites for which Site Restoration and Rehabilitation has been completed</li> </ul>	Construction Camps and Plant Sites	Pre-Construction	Contractor
5	<ul style="list-style-type: none"> <li>No. of Trees to be Cut</li> <li>No. of Trees cut</li> <li>% Progress on the tree removal</li> </ul>	Tree cutting	Pre-Construction	CSC/CMU/HPRIDC
6	No. of Locations identified for temporary storage areas for storage of the excavated materials to be used in embankment and sub grade	Storage of excavated materials	Pre-Construction and Construction	Contractor
7	Before the onset of monsoon all the debris/excavated material shall be cleaned from the work sites and disposed of at the pre-identified approved locations.	Silting of Water bodies	Construction	Contractor
8	Implementation of enhancement measures for <ul style="list-style-type: none"> <li>Noise Barrier at sensitive locations</li> </ul>	Enhancements	Construction	Contractor
9	Drainage <ul style="list-style-type: none"> <li>Length (by type)</li> <li>No. of Locations</li> </ul>	Work sites	Construction	Contractor
10	Safety Provisions <ul style="list-style-type: none"> <li>Signage (by type and no.)</li> <li>Crash barriers</li> <li>footpath</li> </ul>	Work sites	Construction	Contractor
11	Soil erosion prevention measures <ul style="list-style-type: none"> <li>Construction of retaining walls</li> <li>Downstream at culvert locations (No. of Locations &amp; length)</li> </ul>	Work sites	Construction	Contractor
12	No. of HIV awareness sessions conducted	-	Construction	Contractor
13	No. of safety awareness sessions conducted	-	Construction	Contractor
14	Accidents <ul style="list-style-type: none"> <li>No of accidents recorded</li> </ul>	Along project road	During construction	Contractor

S No.	Description of Item	Indicator	Stage	Responsibility
15	Environmental parameter monitoring in accordance with the frequency and duration of monitoring as well as the locations as per the Monitoring Plan given in <b>Table 5-2</b>	Air Quality Noise Quality Soil Quality Water Quality	Construction and Operation	Contractor through NABL Accredited agency.
16	<ul style="list-style-type: none"> <li>• No. of Training Sessions Organised for               <ol style="list-style-type: none"> <li>i. Departmental Staff</li> <li>ii. Contractors</li> <li>iii. Combined</li> </ol> </li> <li>• No. of People Trained               <ol style="list-style-type: none"> <li>iv. Departmental Staff</li> <li>v. Contractors</li> </ol> </li> </ul>	Training Imparted	Construction /Operational face	CSC/CMU/ HPRIDC
17	No. of awareness sessions for educating the public about road safety and other environmental aspects (Such as waste dumping, preservation of enhanced sites, pollution and health impacts etc.)	-	Construction/ Operation Stage	CSC/CMU/ HPRIDC
18	No. of Trees Planted (Total) <ul style="list-style-type: none"> <li>• No. of Trees under Compensatory Afforestation</li> <li>• No. of Trees Planted along Roadsides</li> <li>• No. of Trees planted at other locations (such as camps, borrow areas, debris disposal sites and plant areas)</li> <li>• No. of trees planted at enhancement sites</li> </ul>	Roadside and other plantation areas	Post construction stage	Forest Department and ESMU
19	Survival Rate Trees Planted (Average) <ul style="list-style-type: none"> <li>• Compensatory Afforestation</li> <li>• Roadside Plantation</li> <li>• Other locations (such as camps, borrow areas, debris disposal sites and plant areas)</li> <li>• Enhancement sites</li> </ul>	Roadside and other plantation areas	Post construction stage	Forest Department and ESMU

### 5.3 Monitoring Plan for Environmental Conditions

46. For each of the Environmental Conditions, the Monitoring Plan specifies the parameters to be monitored, location of the monitoring sites, frequency and duration of monitoring. The monitoring plan also specifies the applicable standards, implementation and supervising responsibilities. The monitoring plan and details of monitoring locations for environmental condition indicators of the project during the construction and operation stage are presented in **Table 5-2**.

47. The monitoring will be carried out by Contractor through the NABL approved agency and will be supervised by the Environment Specialists of the CSC and HPRIDCL.

**Table 5-2: Environmental Monitoring Plan for Air, Water, Noise and Soil along Project Road**

Attribute	Timing	Parameter	Special Guidance	Standards	Frequency	Duration	Sampling Locations	Total No of Samples	Implementation/Supervision Responsibility
Air	Construction phases (18 months)	CO, NO <sub>x</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> and SO <sub>2</sub>	High Volume sampler to be located in the down wind direction. Use method specified by CPCB for Analysis	CPCB Guidelines (NAAQMS/ Volume-I/2013-14)	Every month at 4 locations for 18 months during construction period and 12 months during Defect liability Period (DLP)	24 hours sampling	4 locations covering road construction sites, camp sites, crusher/hot mix/batch mix plants sites, and workforce camps, roadside sensitive receptor locations	288	Environmental Officer of Contractor under the overall guidance of Environmental Specialist of CSC and Environment specialist at HPRIDCL
	Operation (limited to 12 months defect liability period)								Environmental Officer of Contractor under the overall guidance of Environmental Specialist of CSC and Environment specialist at HPRIDCL
Water	Construction phases (18 months)	As per Drinking Water Standards	Grab sample collected from source and analyse as per standard methods for examination	Indian standards for inland surface waters (IS:2296,198 2) and for drinking water (IS:10500-2012)	Every month at 4 locations for 18 months during construction period and 12 months during Defect liability Period (DLP)	As per Grab Sampling guidelines	2 locations covering drinking water sources for workforce camps and hand pumps/natural water sources along/near to project road construction activities	134	Environmental Officer of Contractor under the overall guidance of Environmental Specialist of CSC and Environment specialist at HPRIDCL
	Operation (limited to 12 months defect liability period)								Environmental Officer of Contractor under the overall guidance of Environmental Specialist of CSC and Environment specialist at HPRIDCL
Noise	Construction phases (18 months)	Noise Levels on dB (A) scale	Equivalent noise levels using, and integrated noise level meter kept at 15 m from edge of pavement	Noise rules by 2000 CPCB	Every month at 2 locations	Leq in dB(A) of daytime and night-time	4 locations covering road construction sites, camp sites, crusher/hot mix/batch mix plants sites, and workforce camps, roadside sensitive receptor locations	288	Environmental Officer of Contractor under the overall guidance of Environmental Specialist of CSC and Environment specialist at HPRIDCL
	Operation (limited to 12 months defect liability period)				Once every season for 5 year after completion of construction activity				Environmental Officer of Contractor under the overall guidance of Environmental Specialist of CSC and Environment specialist at HPRIDCL

Attribute	Timing	Parameter	Special Guidance	Standards	Frequency	Duration	Sampling Locations	Total No of Samples	Implementation/Supervision Responsibility
Soil	Construction phases (18 months)	Monitoring of Pb, SAR and Oil and Grease	Sample of soil collected to acidified and analysed using absorption spectrum	(IS): 2720 for 'Method of Test for Soils'	During the pre & post monsoon season each year	Grab Sampling	4 locations covering road construction sites, camp sites, crusher/hot mix/batch mix plants sites, and workforce camps, roadside sensitive receptor locations,	134	Environmental Officer of Contractor under the overall guidance of Environmental Specialist of CSC and Environment specialist at HPRIDCL
	Operation (limited to 12 months defect liability period)								Environmental Officer of Contractor under the overall guidance of Environmental Specialist of CSC and Environment specialist at HPRIDCL

#### 5.4 Reporting system

48. Reporting system for the suggested monitoring programme operates at two levels:

- Reporting for environmental condition indicators and environmental management indicators
- Reporting for operational performance indicators at the CSC level.

49. Environmental monitoring involves regular checking of the environmental management issues detailed in the EMP and to ascertain whether the mitigation measures are achieving their objectives, according to the EMP, with the progress of the works. It provides the necessary feedback for Project management to keep the programme on schedule.

50. The Contractor, CSC will operate the reporting system for environmental conditions and environmental management indicators. The reporting system is presented in **Table 5-3**. Reporting formats for Contractors have been prepared, which will form the basis of the implementation by the Contractor and monitoring by the CSC under the overall guidance of the Project Director cum Chief Engineer of HPRIDCL. The list of reporting formats (refer **Appendix-7**) prepared for the implementation of ESMP is presented in **Table 5-4**.

- The reporting system will start with the Construction Contractor who is the main executor of the implementation activities. The Contractor will report to the Construction Supervision Consultant, who in turn shall report to the HPRIDCL.
- The Contractor will submit monthly and quarterly environmental compliance reports along with formal monthly and quarterly reporting to the CSC.
- The CSC will submit separate quarterly environmental monitoring reports to HPRIDCL in addition to submission of the summary of the activities of the month in the formal monthly report including any deviations and corrective actions
- CSC will be responsible for the preparation of the targets for identified non-compliances.
- Solutions for further effective implementation may also emerge as a result of the compliance monitoring reports.
- Environmental Management Compliance Certificate will be issued by Environment Specialist of HPRIDCL during the submission of each Interim Payment Certificate (IPC). This certificate will be based on compliance status of environmental measures during that tenure for which IPC has been produced (ref. **Appendix-13**).
- Photographic records will be kept to provide useful environmental monitoring tools. All material source locations, debris disposal locations, plant's locations, Construction camp locations, Crusher locations etc. will have a complete photographic record. Photographs for all these establishments will be taken prior to establishment activities begin, during the establishment and operation process and after rehabilitation. The record will be submitted to CSC half yearly and will also be availed to CMU and HPRIDCL as and when required.
- A full record of construction activities will be kept as a part of normal Contract monitoring system.
- The operation stage monitoring reports may be annual, provided the Project Environmental Completion Report shows that the implementation was satisfactory.

51. This reporting will be as follows:

- Reporting by the Contractor to the CSC.
- Reporting by CSC to HPRIDCL.
- Reporting by HPRIDCL for the information of all interested parties.

**Table 5-3: ESMP Implementation Reporting Schedule for Project Road**

Items	Contractor	Construction Supervision Consultant (CSC)		HPRIDCL		World Bank (WB)
	Implementation & Reporting to CSC	Supervision	Reporting to HPRIDCL	Oversee Compliance Monitoring	Report to WB	Desired Supervision
<b>Construction Stage</b>						
Monitoring of Construction Site and Construction Camp	Before start of work	Regular	Monthly	Monthly	Quarterly	Half Yearly
Pollution Monitoring	Monthly	As required	Monthly	Monthly	Quarterly	Half Yearly
Debris Disposal Area	Weekly	Regular	Monthly	Monthly	Quarterly	Half Yearly
Monitoring of Enhancements	Implementation	As required	Monthly	Monthly	Quarterly	Half Yearly
Topsoil Preservations	Weekly	As required	Monthly	Monthly	Quarterly	Half Yearly
Borrow Area/Quarry Area/Debris Disposal Area	As required	As required	Monthly	Monthly	Quarterly	Half Yearly
Tree Cutting	As required	As required	Monthly	Monthly	Quarterly	Half Yearly
Tree Plantation	As required	As required	Monthly	Monthly	Quarterly	Half Yearly
<b>Operation Stage</b>						
Pollution Monitoring	Monthly	Quarterly	Quarterly	Quarterly	Quarterly	Half Yearly

**Table 5-4: Summary Details of Reporting Formats**

Format No.	Item	Stage	Contractor	Construction Supervision Consultant (CSC)	
			Implementation & reporting to CSC	Supervision	Reporting to HPRIDCL
RF 1	Approval of Construction Camp/ Plant Site and its Management Plan	Pre-Construction	One Time	One Time	One Time
RF 2	Approval of Borrow Management Plan (General & Specific)	Pre-Construction	General -One Time Specific re-development plan - one for each borrow area	Regular	Monthly
RF 3	Construction Camp and Plant Site Management	Construction	Monthly	Regular	Monthly
RF 4	Topsoil Management	Construction	Monthly	Regular	Monthly
RF 5	Pollution Control and Construction Plants	Construction	Monthly	Regular	Monthly
	Pollution Monitoring	Construction and Operation	As required/ Monthly		Monthly

Format No.	Item	Stage	Contractor	Construction Supervision Consultant (CSC)	
			Implementation & reporting to CSC	Supervision	Reporting to HPRIDCL
RF 6	Vehicles and Pollution Control	Construction	Monthly	Regular	Monthly
RF 7	Details of the DG Sets and Pollution Control	Construction	Monthly	Regular	Monthly
RF 8	Details of Oil Storage	Construction	Monthly	Regular	Monthly
RF 9	Working at Water Courses & Pollution Control	Construction	Monthly	Regular	Monthly
RF 10	Details of Water Extraction	Construction	Monthly	Regular	Monthly
RF 11	Details of Personal Protective Equipment	Construction	Monthly	Regular	Monthly
RF 12	Status of Consent for Water Extraction	Construction	Quarterly	Quarterly	Monthly
RF 13	Deviations and Corrective Actions	Construction	As required/ Monthly	Monthly	Monthly
RF 14	Implementation of Enhancement Measures for Cultural Properties, Water Harvesting Structures	Construction	Monthly	Regular	Monthly
RF 15	Debris generated by the hill ward side widening, cutting of hill slopes	During construction	Throughout the construction period of road and Jetty during widening	Regular	Monthly
RF 16	Grievance Redressal Mechanism during Construction	During Construction	Monthly	Regular	Monthly
RF 17	Work Force Management	During Construction	Monthly	Regular	Monthly
RF 18	Occupational Health Safety Measures	During Construction	Monthly	Regular	Monthly
RF 19	Road Safety Measures	During Construction	Monthly	Regular	Monthly
RF 20	Accidents Reporting	During Construction	Within 24 hrs	Regular	Within 24 hrs
RF 21	Monthly Reporting	During Construction	Monthly	Regular	Monthly (as an annexure to MPR)

52. The Environment Specialist of CSC in consultation with the Environmental Specialist of HPRIDCL, under the overall guidance of Project Director cum Chief Engineer can make required changes in the formats specified in appendices of ESMP to ensure effective reporting of environmental issues. For making any required changes in the frequency of reporting and change in the contents of the report for effective and simple



for implementation and monitoring, CSC should discuss the reporting formats with the Contractor and HPRIDCL. This will not only ensure that the environmental provisions are addressed but also link the satisfactory compliance to environmental procedures prior to approval of the Interim Payment Certificate (IPC) by the CSC. In the regular monthly meeting, the environmental aspects should be discussed and the staff responsible for the implementation of the environmental management from the Contractor and CSC. The Environmental Specialist of HPRIDCL shall also be present as required.

## **5.5 Institutional Arrangements for ESMP Implementation**

53. Institutional arrangements for implementation of ESMP have an objective to achieve environmentally as well as socially sustainable project activities under HPSRTP as well as to meet the World Bank ESS (Environment and Social Standards), which concurrently also will enable that to comply with the GoI as well as GoHP regulations during the pre-construction, construction and operational phases of HPSRTP. The ESMP implementation arrangements will also ensure to comply with loan covenants as specified by the various conditions of loan agreement between the World Bank and the GoHP.

54. The institutional arrangement/ organization structure for implementation of ESMP is given in **Figure 5-1**. The implementation of ESMP will be overseen at HPRIDCL by the Project Director cum Chief Engineer, who is also responsible for the successful implementation of all project activities under HPSRTP.

55. The Project Director (PD) will be assisted by Construction Supervision Consultant (CSC) for implementation of ESMP at each of the contract package levels. The CSC shall provide one Environmental Specialist, one Social Development Specialist and one Bio-Engineering Specialist for implementation of ESMP and shall coordinate with the Environmental Specialist at HPRIDCL headquarters for the implementation of ESMP for all the contract packages under the overall guidance of Project Director.

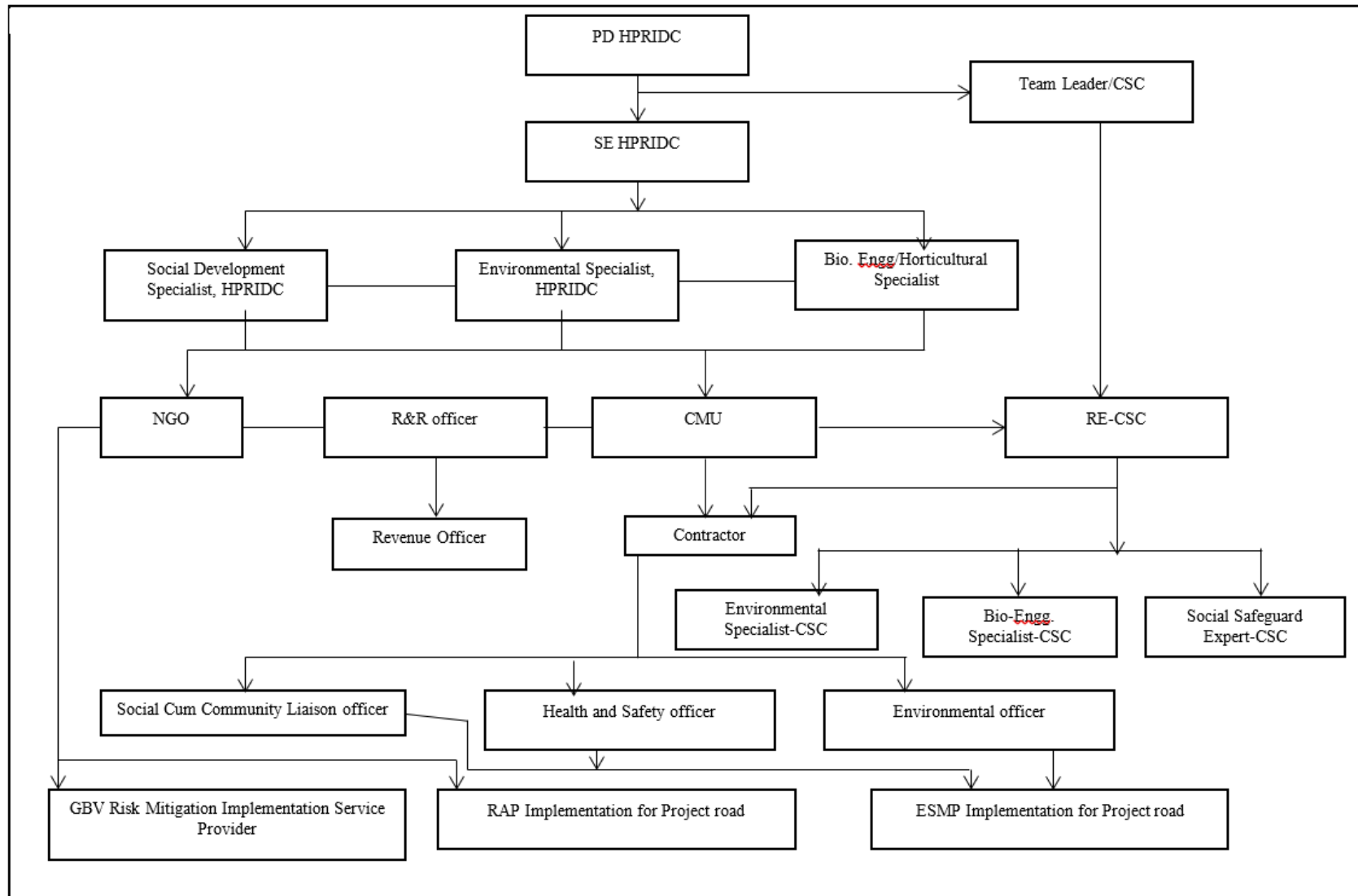
56. At specific project road corridor or contract package level, the Contractor shall provide one Social cum Community Liaison Officer, one Health & Safety Officer and one Environmental Officer, who shall be responsible for implementation of ESMP at field level under the guidance of the CSC.

57. The HPRIDCL has already appointed an NGO for implementation of RAP for all 4 Tranche I corridors including project road. The NGO will provide required Social Development Officer and other field staff, and coordinate with revenue departments and district administration as well as with CSC for effectively implementing the RAP provisions in accordance RPF and ensure timely disbursement of compensation/ entitlements prior to clearing of encroachments. The NGO shall also coordinate with CSC in timely handling over the encumbrance free stretches to the contractor for commencement of construction.

## **5.6 ESMP Implementation Monitoring and Reporting**

58. The ESMP implementation monitoring, and reporting shall be through daily, weekly and monthly progress reports. The monthly reports shall further consolidate into quarterly, half yearly and annual consolidated reports. The checklists for monitoring the ESMP implementation shall be developed by CSC, based on the approved C-ESMP of the Contractor, prior to commencement of Construction works.

59. The ESMP implementation progress monitoring shall capture status of ESMP measures, implemented by contractor and shall list compliance(s) and non-compliance(s) to respective measures as well as compliance(s) to consent conditions stipulated by HPSPCB. The report shall include a list of Actions to be Taken and Action Taken Report by the contractor, which shall also be monitored by the CSC. The periodic progress report(s) shall cover all operational areas as well as designated work camp sites, hot mix plants, material stack yards along with the periodic environmental monitoring carried out covering all such operational areas, where work is under progress and establishment sites as may be required.



**Figure 5-1: Institutional arrangements for implementation of ESMP/ RAP**

## 5.7 Training and Capacity Building

60. As a training and capacity building initiative, designated HPRIDCL staff will be deputed for exposure visits to other similar road construction projects with good track record for RAP and ESMP implementation. The HPORDC and CSC staff will also be sponsored for training courses conducted by accredited institutions in Resettlement and Rehabilitation (R&R) and ESMP implementation, if warranted.

## 5.8 Grievance Redress Mechanism

61. HPRIDCL will establish GRM at each contract package level; which resolve complaints/grievances from both PAP's/PAFs, to redress the complaints arising due to on-site verification of PAPs/PAFs, determination of applicable entitlements, disbursements of entitlements during implementation of RAP, of which will be largely completed during pre-construction phase.

62. The same GRM (through sub-committee) will also address the complaints received during the project construction phase, which could be mainly arising due to construction activities of contractor like loss of access, damage to some private or common property or utilities, vibration, noise and dust levels due to excavation works, inadequate/inappropriate diversions, traffic mis-management, community safety and other similar issues/concerns. Some of the PAPs/PAHs may also become grieved/ complainants during construction phase.

63. The GRM will be independent as per respective mandates and function under CMU/ HPRIDCL. The institutional arrangements, procedure for receiving complaints, time limits for redressal of complaints are as stipulated in the stakeholder engagement plan (SEP) under for HPSRTP.

64. In addition, the contractor will be contractually obligated to set up another GRM, mainly to redress complaints relating to workforce, deployed for project road construction, in accordance with the labor management procedure (LMP) under HPSRTP.

65. The GRM to be set up by the Contractor will have designated institutional arrangements, procedure for receiving complaints, time limits for redressal of complaints, of which, will be detailed in C- ESMP, to be submitted by the contractor and approved, prior to commencement of works.

66. The contact details/information for lodging grievances, inquiries, and further feedback under project road as well as any project intervention under HPSRTP is given in **Table 5-5** hereunder. Notifications regarding constitution of committees by HPRIDCL would be done prior to award of works by HPRIDCL and the details will be notified prior to commencement of construction at the prominent community locations and also in the villages en-route along project corridors. Additionally, all such details would also be displayed in the micro-plans (prepared for provision of R&R assistances) that would be displayed in the project affected villages, along project corridors under HPSRTP.

**Table 5-5: Contact Details for Lodging Grievances and Feedback under HPSRTP**

Description	Contact details
Name of Authority:	Himachal Pradesh State Road & Infrastructure Development Corporation Limited (HPRIDCL)
Contact Person /Designated Authority	Chief Engineer-cum-Project Director
Address:	HP State Roads Project, HPRIDCL, Nirman Bhawan, Nigam Vihar, Shimla – 171 002, Himachal Pradesh
E-mail:	pdsrp-hp@nic.in
Website:	<a href="http://www.himachalservices.nic.in/hpridcl">http://www.himachalservices.nic.in/hpridcl</a>
Telephone:	Tel: 0177 – 2627602, 2620663
Fax:	0177 – 2620663

## 6. CAPACITY BUILDING AND TRAINING

### 6.1 Need

67. Capacity building and training would be required especially for the Contractor's staffs, CSC staff associated with the project as part of the Environmental and Social Safeguards staff. The training and capacity building would not only be project specific but would also target and develop long term capacities at CMU and HPRIDCL.

### 6.2 Training Programmes

68. The training programme will be implemented as per training modules provided in **Table 6-1**. These training programmes are not part of the Contractors plan and estimates but will be a part of the project cost that includes institutional strengthening, capacity building and training. Training module can be changed during construction phase based on requirements by HPRIDCL. Total earmarked training & capacity building cost is estimated 10 lakhs. Out of this amount, seven lakhs have been proposed for Training's sessions for 9 days (in complete project cycle) as given in **Table 6-1**. The schedule for Crash Courses on Focused Themes Relating to Environmental Management as suggested in **Table 6-2**.

69. The basic objective of giving training to different Stakeholder is to enhance their capabilities for implementation of Environmental Management and Monitoring Plan. It is recommended that training be given at least 4 times both offsite and on site.

- Before Start of Construction Work
- During Construction
- Before de-mobilization of Contractor
- After Construction before Start of Monitoring

**Table 6-1: Training Module for Capacity Building**

S. No.	Training Recipients	Mode of Training	Environmental Aspects to be covered in training modules	Training Conducting Agency
<b>(Before Start of Construction Work by ESMU)</b>				
<b>One day</b>				
1	Staff of CSC & Contractor	Lecture Session, presentation & discussion	World Bank's Environment and Social Management Framework	Environment Specialist, HPRIDCL
2	Staff of CSC & Contractor	Lecture Session, presentation & discussion	Legal requirements of the project	Environment Specialist, HPRIDCL
3	Staff of CSC & Contractor	Lecture Session, presentation & discussion	Specific Environment and Social Management Plan	Environment Specialist, HPRIDCL
<b>(Before Start of Construction Work)</b>				
<b>Day-1 (Session-I)</b>				
1	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture Sessions, Presentation and discussion	Overall generic Environment Issues, Regulations & Statuary requirements and Mitigation Measures	CSC
2	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture Sessions, Workshops & Presentation	Institutional Set Up, Role and Responsibility of Stake Holders and Contractual obligations	CSC
<b>Day-1 (Session-II)</b>				
3	Engineering, Environmental, Social, Health and Safety Staff of Contractor.	Lecture Sessions, Workshops & Presentation	Bio-engineering. Introduction, Scope, institutional Set Up, methods etc	CSC/ HPRIDCL
4	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture Sessions, Workshops & Presentation	Biodiversity Management; Concept, scopes and measures in the project	CSC/ HRIDC
<b>Day-2 (Session-I)</b>				
1	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lectures; Demonstration sessions	Project related environmental issues and Project related mitigation measures	CSC/ HPRIDCL

S. No.	Training Recipients	Mode of Training	Environmental Aspects to be covered in training modules	Training Conducting Agency
2	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Group Discussions and action plan for the project	Environmentally Sound Construction Management & Environmentally, Sustainable operations of Highways and Jetty facility	CSC/ HPRIDCL
<b>Day-2 (Session-II)</b>				
3	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lectures; Group Discussions	Supervision and Monitoring, Reporting Formats	CSC/ HPRIDCL
4	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture Sessions, Workshops & Presentation	Occupational Health and Safety Community Health and Safety	CSC/ HPRIDCL
<b>Module for Training During Construction (Immediately after Commencement of Construction activities)</b>				
<b>Day-1</b>				
1	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture Sessions, Presentation & Workshops	Implementation of Environment Management Plan, Environment friendly Construction Methodology and Workers Safety during Construction	CSC
2	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture Sessions, Workshops & Presentation	Interactive discussion, Monitoring and Reporting System	CSC
3	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lectures;	Bio-engineering types and various methods	CSC
<b>Day-2</b>				
4	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lectures;	Biodiversity Management; Concept, scopes and measures in the project	CSC/ HPRIDCL
5	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lectures;	Occupational and Community Health and Safety; Introduction, Scope and management measures	CSC/ HPRIDCL
6	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lectures;	Stake holder's engagement procedures, Grievance redressal mechanism	CSC/ HPRIDCL

S. No.	Training Recipients	Mode of Training	Environmental Aspects to be covered in training modules	Training Conducting Agency
<b>Module for Training during Construction</b>				
<b>One day</b>				
1	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture Sessions, Workshops & Presentation	Environment friendly Construction Methodology and Workers Safety	CSC
2	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Practical on Site	Traffic and Safety Management during construction; Safety Practices	CSC
3	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Practical on Site	Demonstration of Bioengineering techniques to be used in project on site	CSC/ HPRIDCL
<b>Module for Training before Contractor Demobilization</b>				
<b>One day</b>				
1	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture, Presentation Sessions	Restoration of Site	CSC/ HPRIDCL
2	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture Sessions, Presentation, Workshop and lesson learned	Reporting Formats for Restoration	CSC/ HPRIDCL
<b>During Operation Stage but prior to Start of Environmental Monitoring</b>				
<b>One day</b>				
1	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture Sessions, Presentation and Workshop	Environment Monitoring	CSC/ HPRIDCL
2	Engineering, Environmental, Social, Health and Safety Staff of Contractor	Lecture Sessions, Presentation, Workshop	Reporting Formats	CSC/ HPRIDCL

**Table 6-2: Crash Courses on Focused Themes Relating to Environmental Management**

S. No	Training Institutions	Target groups	Contents of the training
1	Indian institute of Remote sensing, Dehradun	PWD Executive Engineers	Geographic information Systems (GIS)
2	National Environmental Engineering Research Institute (NERI) Nagpur	Junior Engineers	Air, Water Noise Quality modelling
3	National Remote Sensing Agency, Hyderabad	Assistant Engineers	Application of satellite imageries in road planning
4	Indian Institute of Ecology and Environment, New Delhi	Selected Engineers from all levels	Himalayan Ecology
5	Forest Research Institute, Dehradun	Environmental Engineers	Training programme on environmental management relating to transport projects
6	Centre of Environmental Education, Ahmadabad	Selected Engineers from all levels	Legal dimension of Environmental management
7	Wadia Institute of Himalayan Geology	Junior Engineers	Himalayan Geology and seismicity
8	National Institute of Training for Highway Engineers (NITHE), Noida	Junior and Assistant Engineers	Environmental Management in Transport Projects
9	Environment Protection Training and Research Institute, Hyderabad	Junior Engineers	Theoretical aspects of environmental management
10	Tata Energy Research Institute (TERI)	Assistant Engineers	Hydro Energy and ecological systems
11	Centre for Water Resources Development and Management, (CWRDM) Kozhikode, Kerala	Selected group of Engineers	Water Resources Management in hilly terrain
12	Centre for Earth Science Studies, Thiruvananthapuram, Kerala	Selected Group of Engineers	Tectonic and Seismic forces in Himalayan Region
13	Kerala Forest Research Institute (KFRI) Trichur, Kerala	Senior Engineers	Biodiversity and forest ecosystems
14	Hind swaraj trust, Ahmed Nagar Pune	Junior and Assistant Engineers	Soil and water conservation

70. These training programmes are expected to impart in-depth knowledge from experienced professional working at geographically distant locations. However, these training programmes are only indicative and can be considered in coordination with the respective institutes in geographically distant areas of the Indian sub-continent.



## 7. IMPLEMENTATION SCHEDULE

71. The project road construction and implementation schedule are about 24 months. Tentative implementation schedule of the project is listed in **Table 7-1**.

**Table 7-1: Project Preparation and Implementation Schedule**

S. No	Description	Indicative Time Frame
<b>1</b>	<b>Project Implementation</b>	
A	Detailed Design and Bidding Documents	Month of August 2021
B	Procurement	Sept.-Oct. 2021
C	Construction commencement	Oct.-Dec. 2021
D	Project Completion	24 months (Nov. 2023)
E	Defects Liability Period	One year after completion date
<b>2</b>	<b>Environmental Management - Construction Phase</b>	
A	Design Review and Technical Audit Consultant of CSC	Starting (intermittent inputs whenever necessary)
B	Preparation of Site-specific C-ESMP by contractor based on ESIA and ESMP	Within one month after contractor's mobilization but prior to commencement of works on site
C	Submission and finalization of Contractor's Environmental & Social Management Plan Report (C-ESMP) for submission to HPRIDCL/ World Bank	Within two months after contractor's mobilization
D	C-ESMP implementation <b>monthly</b> Progress Report (for ongoing month) for submission to HPRIDCL	8 <sup>th</sup> day after successive month
E	C-ESMP implementation <b>quarterly</b> Progress Report for submission to HPRIDCL/ World Bank	8 <sup>th</sup> day after every successive quarter (3 months)
F	C-ESMP implementation <b>half yearly</b> Progress Report for submission to HPRIDCL/ World Bank.	8 <sup>th</sup> day after every successive half yearly (6 months)
<b>3</b>	<b>Environmental Management - Operation Phase</b>	
A	Preparation of Site-specific C-ESMP for operation phase by contractor	Within one month after contractor's mobilization but prior to commencement of works on site
B	Submission and finalization of Contractor's Environmental & Social Management Plan Report (C-ESMP) for submission to HPRIDCL/ World Bank	Within two months after contractor's mobilization
C	C-ESMP implementation <b>monthly</b> Progress Report (for ongoing month) for submission to HPRIDCL	8 <sup>th</sup> day after successive month
D	C-ESMP implementation <b>quarterly</b> Progress Report for submission to HPRIDCL/ World Bank	8 <sup>th</sup> day after every successive quarter (3 months)
E	C-ESMP implementation <b>half yearly</b> Progress Report for submission to HPRIDCL/ World Bank.	8 <sup>th</sup> day after every successive half yearly (6 months)

## 8. BUDGETORY PROVISIONS FOR ESMP IMPLEMENTATION

72. The environmental impact mitigation and management measures as ESMP is given in Table 4-1 under Section 4 and these are akin to Good International Industry Practice (GIIP), considered incidental to works and deemed to be included in the quoted bid price by the contractor. Certain works are included in the BOQ of civil works, which are to be an integral part of civil works and are to be executed as an environmental management measure. These are given in **Table 8-1**.

**Table 8-1: ESMP Works to be implemented as per Civil Works BOQ**

S. No	Description	Amount
1	Disposal of Excess debris Material with applicable lead	Cost included under Civil Works
2	Provisions of erosion control measures, especially at culvert locations; upstream (check dams) and downstream (concrete aprons)	Cost included under Civil Works
3	Providing longitudinal drain on roadsides to channelize the water into nearby cross drainage structures	Cost included under Civil Works
4	Providing protection measures (retaining & breasts walls) to restrain the soil to slopes	Cost included under Civil Works
5	Provision of Retaining/ Gabion Walls to retain debris at all debris disposal sites	Cost included under Civil Works
6	Provision of traffic safeguards measures on the road (information/caution boards, chevrons etc.)	Cost included under Civil Works
7	Traffic and Safety Management During Construction	Cost included under Civil Works

73. However, certain project road specific mitigation measures and/or environmental enhancement measures, considered as additional requirements that are to be implemented by the contractor have also been included against budget provision and integrated in the contract/bidding documents as Mandatory Contractual Obligations. The estimated budgetary provisions for implementation of such specific mitigation measures, ESMP and RAP is INR **909.26 Lakhs**) and given in **Table 8-2**. The detailed description of the project road specific measures is given in a separate volume as ESMP for the project road.

74. Accordingly, ESHS (Environment, Social, Health and Safety) performance requirements by the contractor under contract have been specified and incorporated as special conditions and performance requirements in bid documents of contract package for the project road.

75. Adequate cost provisions for implementation of ESHS requirements have included in the item rates, so that contractor can perform requirements in a fair and objective manner. In addition, a provision of 2% of contract amount has been earmarked as ESHS performance security in the bidding documents. Thus, the contractor is expected to be fully aware of ESHS performance requirements at the bidding stage itself and accordingly deemed to have priced the performance requirements at the bidding stage itself.

76. The ESHS performance requirements incorporated in the bid documents, obligate the contractor, upon mobilization, to prepare a Contractor's ESMP (C-ESMP), which will include impacts mitigation and management plan, environmental enhancement plan, OHS plan, labor management plan, labor Influx management Plan, workers' campsite management plan, GRM for workers', traffic management and road safety management plan, COVID-19 considerations and among others in accordance with the GoI, GoHP, IFC & WB requirements.

77. The C-ESMP will be reviewed in consultation with HPRIDCL and approved by the CSC, prior to commencement of construction works. The approved C-ESMP will be reviewed periodically (but not more than every three (3) months) by CSC and updated in a timely manner, to address changed requirements, if any during project implementation.

78. Budget for addressing pre-construction social impacts is provided as part of the Resettlement Action Plan.

**Table 8-2: Budgetary Provisions for Specific Environmental Impact Mitigation / Enhancement Measures (additional Requirements to be implemented by Contractor against budget)**

S. No	Description	Unit	Quantity	Rate in INR	Amount in INR	Amount in lakhs
1	Conservation/renovation/enhancement measures for natural water source (all season) at chainage KM 3+700- <b>Refer Fig 3-2</b>	1	1	Lumpsum	350000	3.5
2	Conservation/renovation/enhancement measures for religious shrine/structure at chainage KM 3+999- <b>Refer Fig 3-3</b>	1	1	Lumpsum	50000	0.50
3	Conservation/renovation/enhancement measures for open dug well at chainage KM 4+297 - <b>Refer Fig 3-4</b>	1	1	Lumpsum	75000	0.75
4	Provision of crash barrier for primary health centre at chainage KM 4+515 - <b>Refer Fig 3-5</b>	RM	15	As per rates in project cost estimates		
5	Provision of noise barrier for private school at chainage KM 4+773 - <b>Refer Fig 3-6</b>	sq.m	50	10.000/sq.m	500000	5.0
6	Conservation/renovation/enhancement measures for religious shrine/structure (Peepal tree with platform) at chainage KM 5+321 - <b>Refer Fig 3-7</b>	1	1	MR	50000	0.50
7	Conservation/renovation/enhancement measures for relocation of religious shrine at chainage KM 5+989 - <b>Refer Fig 3-8</b>	1	1	Lumpsum	125000	1.25
8	Conservation/renovation/enhancement measures for religious shrine/structure (Peepal tree with platform) at chainage KM 8+275 - <b>Refer Fig 3-9</b>	1	1	Lumpsum	25000	0.25
9	Conservation/renovation/enhancement measures for natural drinking resource at chainage KM 8+280 - <b>Refer Fig 3-10</b>	1	1	Lumpsum	250000	2.50
10	Conservation/renovation/enhancement measures for natural water resource at chainage KM 10+416 - <b>Refer Fig 3-11</b>	1	1	Lumpsum	50000	0.50
11	Conservation/renovation/enhancement measures for religious shrine/structure at chainage KM 10+725 - <b>Refer Fig 3-12</b>	1	1	Lumpsum	50000	0.50
12	Conservation/renovation/enhancement measures for natural water resource at chainage KM 12+482 - <b>Refer Fig 3-13</b>	1	1	Lumpsum	100000	1.0
13	Conservation/renovation/enhancement measures for natural drinking water resource (all season) at chainage KM 18+048- <b>Refer Fig 3-14</b>	1	1	Lumpsum	100000	1.0
14	Provision of noise barrier for school at chainage KM 22+545 - <b>Refer Fig 3-15</b>	sq.m	60	10.000/sq.m	600000	6.0
15	Conservation/renovation/enhancement measures for religious shrine/structure (Peepal tree with platform) at chainage KM 22+997 - <b>Refer Fig 3-16</b>	1	1	MR	50000	0.50
16	Conservation/renovation/enhancement measures for religious shrine/structure at chainage KM 24+218 - <b>Refer Fig 3-17</b>	1	1	Lumpsum	300000	3.0
17	Conservation/renovation/enhancement measures for religious shrine/structure (Peepal tree with platform) at chainage KM 24+734 - <b>Refer Fig 3-18</b>	1	1	Lumpsum	200000	2.0
18	Conservation/renovation/enhancement measures for small temple (lakhdatta peer) at chainage KM 28+216 <b>Refer Fig 3-19</b>	1	1	Lumpsum	300000	3.0

S. No	Description	Unit	Quantity	Rate in INR	Amount in INR	Amount in lakhs
19	Conservation/renovation/enhancement measures for religious shrine/structure (Peepal tree with platform) at chainage KM 28+415 Refer Fig 3-20	1	1	Lumpsum	75000	0.75
	<b>Subtotal of conservation/renovation/enhancement measures for natural water source, religious shrine/structure</b>				<b>32,50,000</b>	<b>32.50</b>
20	Provisions for Bio Engineering Interventions at selected locations along the project road as per requirements					
i)	Construction of hedge brush layer	RM	39500	272.82	10776390	107.77
ii)	Construction of brush layer	RM	38530	178.09	6861807	68.62
iii)	Construction of live palisade	RM	1430	134.66	192563	1.93
iv)	Construction of live Fascine	RM	2760	176.33	486670	4.87
v)	Grass slip plantation on slope <45° @ 100 drills/sqm	sqm	8630	262.25	2263217	22.63
vi)	Grass slip plantation on slope 45°-60° @ 100 drills/sqm	sqm	3200	310.50	993600	9.94
vii)	Grass slip plantation on >60° slope @ 100 drills/sqm	sqm	1260	358.75	452025	4.52
viii)	Plantation of large sized stature grass slips at slope of <45° @ 20 slips/sqm	sqm	7560	111.81	845283	8.45
ix)	Bamboo crib wall	cum	1460	2,790.09	4073531	40.74
x)	Tree plantation in plains within RoW	Nos	3200	282.43	903776	9.04
xi)	Shrub Plantation in plains Within Row	Nos	1450	190.70	276515	2.77
xii)	Agave plantation in slopes	Nos	200	60.70	12140	0.12
xiii)	Group plantation of shrubs	sqm	200	55.02	11004	0.11
xiv)	Hedge Plantation (2 plants/RM)	RM	500	106.93	53465	0.53
xv)	Hedge Plantation (4 plants/RM)	RM	500	213.85	106925	1.07
xvi)	Bamboo plantation within RoW	Nos	500	190.70	95350	0.95
xvii)	Grass seed sowing<40°	sqm	31200	105.17	3281304	32.81
xviii)	Grass seed sowing>40°	sqm	31550	163.56	5160318	51.60
xix)	Grass seed sowing on slope 40-45° with mulch and jute netting	sqm	28650	219.02	6274923	62.75
xx)	Hydroseeding including dressing/trimming of slope including removing of fractured material and maintenance with watering 2 to 3 times after 12hrs of hydroseeding @ 1 Litre/Sqm (each time) for six months/propagation of grasses and shrubs under supervision of hydroseeding provider	sqm	35650	525.00	18716250	187.16
	<b>Subtotal of bio-engineering interventions</b>				<b>61837056</b>	<b>618.38</b>
21	Clearance/Removal of Invasive Species like Lantana and Sea Ruthenium etc. form the road corridor and Plantation of Indigenous local vegetation and Maintenance and upkeep for 70% survival rate for 6 months (36 km (both sides) up to width of 1.5 m) (ref. Appendix-16)	Sqm	84000	90	75,60,000	<b>75.60</b>
22	Provision of plantation and maintenance (tree guard) of 3000 Avenue trees along roadside and in RoW @ 1800 per tree.	Nos	3000	1800	54,00,000	<b>54</b>
23	Monitoring Cost as per CPCB Standard Procedures through NABL accredited laboratory					

S. No	Description	Unit	Quantity	Rate in INR	Amount in INR	Amount in lakhs
i)	Ambient Air Quality Monitoring at 8 locations, covering sensitive receptors, work force camp site and operational sites once in a month for 36 months including one year O & M during DLP	No of samples	288	10000	2880000	28.8
ii)	Water quality Monitoring at 4 locations once in a month for 36 months including one-year O & M during DLP	No of samples	134	10000	1340000	13.40
iii)	Noise level Monitoring at 8 locations, covering sensitive receptors, work force camp site and operational sites once in a month for 36 months including one-year O & M during DLP	No of sample	288	3500	1000800	10.08
iv)	Soil Quality Monitoring during pre and post monsoon every year.	No of samples	134	3000	402000	4.02
<b>Subtotal of environmental monitoring</b>					<b>56,22,800</b>	<b>56.30</b>
24	<b><u>Mitigation measures at Associated Facilities</u></b> Provision for river/ stream bed clean-up and bed profile correction (up to 500m on both upstream and downstream side), river bank protection measures (up to 100m on both banks of upstream and downstream side) – at all 4 bridge locations being constructed by HPPWD and qualifying as <u>Associated Facilities</u>	Cost shall be borne by HPRIDCL and item of works will be included in the bid documents for execution by the Contractor under the supervision of CSC				
25	Provision for Compensatory Afforestation in lieu of Tree felling for road construction	Cost shall be borne by HPRIDCL and payment made directly to Department of Forests, GoHP				
26	Provision for deployment of Environmental Specialist, Social Specialist, Horticulture/ Bio-engineering Expert (full time) and Bio-engineering Specialist and Bio-diversity Specialist (intermittent basis) including training sessions for implementation of ESMP	HPRIDCL will recruit positions directly or shall be provided through PMC				
27	Implementation of Resettlement & Rehabilitation Action Plan as per RPF, HPSRTP for Project road	<b>72.48</b>				
28	Relocation and construction of hand pumps, water storage tanks, OHTs, open wells & water taps as per directions of the Engineer.	Covered in Utility Shifting Budget				
29	Cost for institutional strengthening, capacity building and training by HPRIDCL	Cost borne by HPRIDCL				
<b>Total ESMP Budgetary Provision in Lakhs</b>						<b>909.26</b>