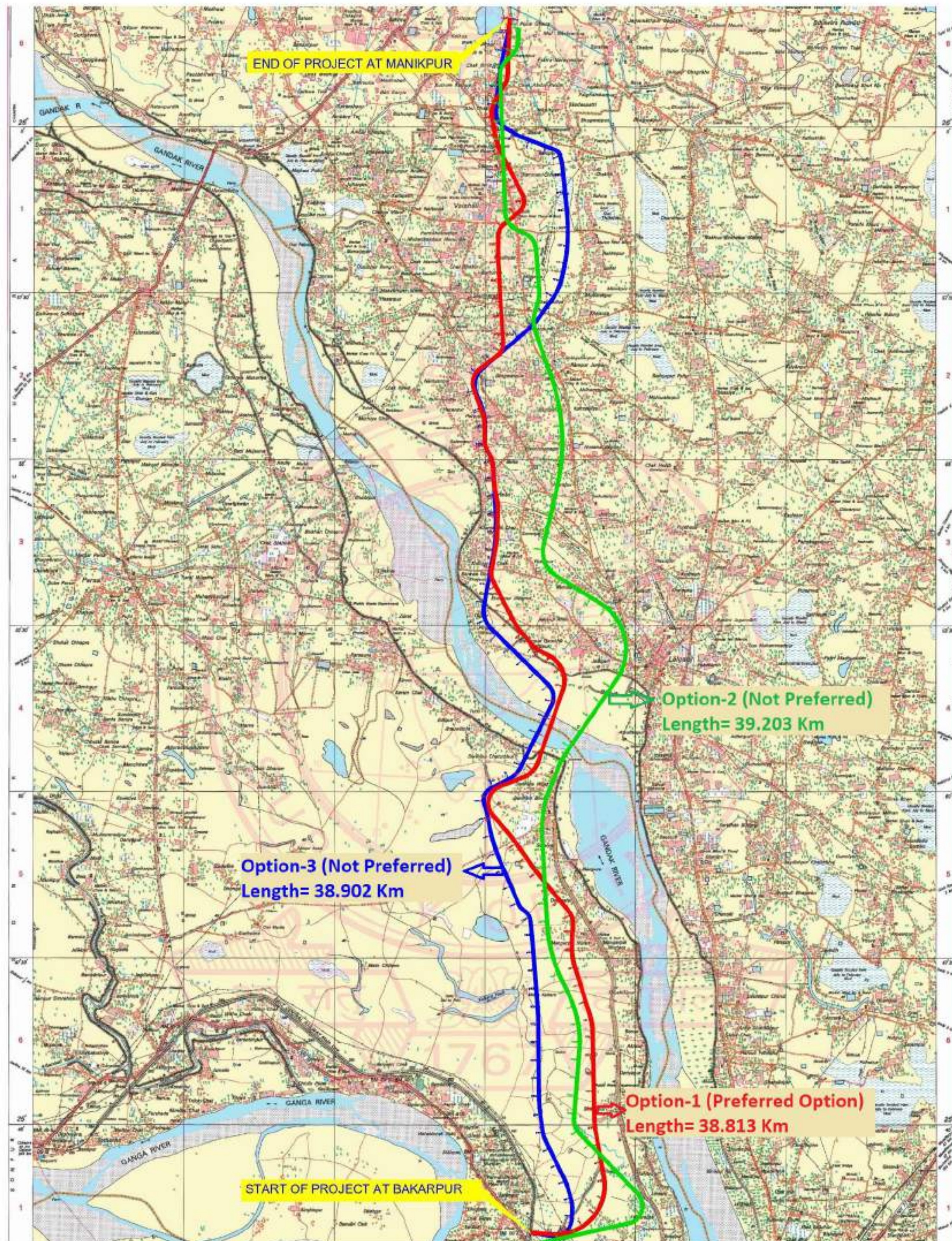


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Annexure 1.1: Proposed Alignment of SOI Map

COMPARISON OF ALIGNMENT FOR BAKARPUR-MANIKPUR PROJECT ROAD IN DISTRICT SARAN, VAISHALI & MUJAFFARPUR IN THE STATE OF BIHAR



LEGENDS:-	
PROPOSED OPTION-1 (LENGTH- 38.813Km.)	—
PROPOSED OPTION-2 (LENGTH- 39.203Km.)	—
PROPOSED OPTION-3 (LENGTH- 38.902Km.)	—

Annexure 1.2: Copy of the Term of
Reference (ToR) obtained from
MoEf&CC

File No.: 10/2/2023-IA.III.
[Proposal No. IA/BR/INFRA1/409319/2022]
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan,
Jor Bagh Road, Ali Ganj
New Delhi – 110 003

Dated: 21st February, 2023

To,
M/s National Highways Authority of India
National Highways Authority of India
G-5 & 6, Sector-10, Dwarka, New Delhi-110 075.

Subject: Development of 4 lane Bakarpur-Manikpur Section, starting from design km 0.000 at Sitalpur bypass of NH-19 near village Bakarpur in District Saran and terminate at design km 38.813 near village Manikpur merge into SH-74 in District Muzaffarpur in the State of Bihar (total length – 38.813 km) by M/s National Highways Authority of India–Terms of Reference.

Sir,

This has reference to your online proposal submitted to this Ministry on 13th December, 2022 seeking Terms of Reference (TOR) for the aforementioned project as per the provisions of the Environment Impact Assessment (EIA) Notification, 2006 and subsequent amendments under the Environment (Protection) Act, 1986.

2. The aforementioned proposal was placed before the EAC in its 318th meeting during 12th – 13th January 2023. The project proponent made a presentation through Video Conferencing and provided the following information –

- i. The project is for construction of 4 Lane Bakarpur-Manikpur Section starts from village Bakarpur, design Ch. 0+000 (Start Location: 25°43'23.05"N, 85° 8'18.61"E) at Sitalpur bypass of NH-19 in district Saran and ends near Manikpur village, Design Ch. 38+813(End Location: 26° 1'38.15"N, 85° 7'54.47"E) merge into SH-74 in Muzaffarpur district in the state of Bihar. The alignment falls in 03 districts i.e., "Saran, Vaishali and Muzaffarpur" in the state of Bihar. Right of Way (RoW):45m.
- ii. The proposed project falls under 7(f), Category-A, Highway as per EIA notification 2006. Total investment/cost of the project is 134446 Lakhs.
- iii. Land use/ Land cover (approx. area) of the project site in tabular form:

S. No.	Land use / Land cover	Area (ha)	Percentage %	Remarks if any
1.	Private land	189.3762	93.1965	Agriculture Land
2.	Government land	9.7168	4.7819	Agriculture / Barren / other Land
3.	Forest land	4.108	2.0216	Protected Forest land (Vacant land of crossing of link roads and river.



	Total	203.201	100	-
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- iv. Terrain and topographical features: The terrain of the alignment is basically plain.
 - v. Details of water bodies: The proposed alignment is crossing through 1 nos. of river. The balancing culverts shall be provided to ensure no water logging in the area and all storm water shall be channelized systematically to the nearest natural stream.
 - vi. Water requirements: Approx. 1250 KLD Water will be extracted from suitable surface sources (river/canals). Ground water proposed to be used only for camp site for transient period after obtaining the permissions from appropriate authority, or ground water after obtaining necessary permissions from the competent authority.
 - vii. Tree cutting: About 1678 trees are likely to be affected due to proposed RoW of 60 m out of which approx. 540 nos. of trees fall in protected forest land (vacant space on both sides of existing crossing roads & River has been notified as Protected Forest) and remaining 1138 falls in the private agriculture field. The actual no. of trees proposed to be cut will be provided in the EIA after joint enumeration with appropriate authorities of respective State Government. Efforts will be made to minimize the trees loss by restricting trees cutting within formation width/toe lane. Avenue plantation shall be carried out as IRC: SP: 21:2009.
 - viii. Diversion of forest land: The proposed project highway will require diversion of 4.108 ha. of Protected Forest land in district Saran, Vaishali & Muzaffarpur in the state of Bihar. The forest proposal shall be prepared after consultation with concerned forest officer. The proposed project is not passing through any Protected Area (PA) including National Parks, Sanctuaries and tiger Reserves etc.
 - ix. Land acquisition and R&R issues involved: The proposed project alignment falls in 03 districts i.e., "Saran, Vaishali and Muzaffarpur" in the state of Bihar. The Project requires approx. 199,093 ha of land except of 4,108 ha. Forest land. About 172 nos. of structures (Pucca Building, temporary sheds, huts etc.) will be affected due to proposed highway. Compensation shall be paid as per NH Act, 1956 and RFCTLARR Act, 2013.
 - x. Employment potential: During the construction of the road project around 120 persons/day would be employed temporarily for a period of 2.5 years. However due to construction of toll plazas approx. 10 persons will be employed on permanent basis and 50 nos. of employees on temporary basis. The Preference will be given to local people for employment.
 - xi. Benefits of the project: Patna city is connected with several peripheral towns like Muzaffarpur, Bettiah, Motihari, Vaishali etc. through mix of two-lane highways and four lane highways. Due to huge increment of traffic, now a day's huge traffic jam is common phenomenon in this existing two-lane road (Adalwari-Manikpur). Hence, it becomes necessary to connect Patna city with the peripheral towns through proper four lane roads. Hence, proposal for connecting Patna city and Rampur with four lane corridors has been entrusted by the authority by several segments of road projects.
 - xii. Details of court cases: No court cases are pending against the proposed project.
3. The EAC based on the information submitted and clarifications provided by the project proponent and detailed discussions held on all the issues during 318th meeting during 12th-13th January, 2023, recommended the project for grant of Terms of Reference (ToR) with stipulated specific conditions along with other Standard ToR Conditions.

4. The Ministry of Environment, Forest and Climate Change has considered the proposal based on the recommendations of the Expert Appraisal Committee (Infrastructure, CRZ and other Miscellaneous projects) and hereby decided to grant Terms of Reference for the "Development of 4 lane Bakarpur-Manikpur Section, starting from design km 0.000 at Sitalpur bypass of NH-19 near village Bakarpur in District Saran and terminate at design km 38.813 near village Manikpur merge into SH-74 in District Mujaffarpur in the State of Bihar (total length – 38.813 km) by M/s National Highways Authority of India" and for preparation of EIA/EMP report with public consultations under the EIA Notification, 2006 as amended, subject to strict compliance of the following specific conditions, in addition to all standard ToR conditions applicable for such projects.

SPECIFIC CONDITIONS

- i. The proponent shall carry out a detailed traffic flow study to assess inflow of traffic from adjoining areas like airport/urban cities. The detailed traffic planning studies shall include complete design, drawings and traffic circulation plans (taking into consideration integration with proposed alignment and other state roads etc.). Wherever required adequate connectivity in terms of VUP (vehicle underpass)/ PUP (Pedestrian underpass) needs to be included.
- ii. Road safety audit (along with accident/black spots analysis) by any third-party competent organization at all stages namely at detailed design stage, construction stage and pre-opening stage to ensure that the project road has been constructed considering all the elements of road safety.
- iii. Provide compilation of road kill data on the wildlife on the existing roads (national and state highways) in the vicinity of the proposed project. Provide measures to avoid road kills of wildlife by the way of road kill management plan.
- iv. Trees with heronry (breeding ground for herons), pelicanary or community nesting of birds like Painted Storks, Ibis, Egrets, Pelican, etc will be identified chainage wise and presented in EIA-EMP
- v. The alignment of road should be such that the cutting of trees is kept at bare minimum and for this the proponent shall obtain permission from the competent authorities. Alignment also should be such that it will avoid cutting old and large and heritage trees if any. All such trees should be geo-tagged, photographed and details be submitted in the EIA –EMP report.
- vi. The proponent shall carry out a comprehensive socio-economic assessment and also impact on biodiversity with emphasis on impact of ongoing land acquisition on the local people living around the proposed alignment. The Social Impact Assessment should have social indicators which can reflect on impact of acquisition on fertile land. The Social Impact Assessment shall take into consideration of key parameters like people's dependency on fertile agricultural land, socio-economic spectrum, impact of the project at local and regional levels.
- vii. As per the Ministry's Office Memorandum F. No. 22-65/2017-IA.III dated 30th September, 2020, the project proponent, based on the commitments made during the public hearing, shall include all the activities required to be taken to fulfil these commitments in the Environment Management Plan along with cost estimates of these activities, in addition to the activities proposed as per recommendations of EIA Studies



and the same shall be submitted to the ministry as part of the EIA Report. The EMP shall be implemented at the project cost or any other funding source available with the project proponent.

- viii. In pursuance of Ministry's OM no stated above the project proponent shall add one annexure in the EIA Report indicating all the commitments made by the PP to the public during public hearing and submit it to the Ministry and the EAC.
- ix. The Action Plan on the compliance of the recommendations of the CAG as per Ministry's Circular No. J-11013/71/2016-IA. I (M), dated 25th October, 2017 needs to be submitted at the time of appraisal of the project and included in the EIA/EMP Report.
- x. Passage for animal movement has to be detailed in the report (if alignment is passing through Forest area).
- xi. A comprehensive plan for plantation of three rows of native species, as per IRC guidelines, shall be provided. Such plantation alongside of forest stretch will be over and above the compensatory afforestation. Tree species should be same as per the forest type. Plantation should be done by the state forest department and a proposal for the same should be annexed in the EIA-EMP.
- xii. The PP shall not use groundwater/surface water without obtaining approval from CGWA/SGWA as the case may be. The project proponent shall apply to the Central Ground Water Authority (CGWA)/State Ground Water Authority (SGWA)/Competent Authority, as the case may be, for obtaining No Objection Certificate (NOC), for withdrawal of ground water.
- xiii. Detailed Biodiversity assessment and conservation/mitigation plan be developed by a nationally reputed institute or by a team of expert of national repute.
- xiv. Rain water harvesting structures to be constructed at the either sides of the road with special precaution of oil filters and de-silting chambers.

GENERAL CONDITIONS

Project Description and Design

- (i) A brief description of the project, project name, nature, size, its importance to the region/state and the country shall be submitted.
- (ii) Details of any litigation(s) pending against the project and/or any directions or orders passed by any court of law/any statutory authority against the project to be detailed out.
- (iii) Bridge design in eco sensitive area /mountains be examined keeping in view the rock classification hydrology etc.
- (iv) Examine the road design standards, safety equipment specifications and Management System training to ensure that design details take account of safety concerns and submit the traffic management plan.

Forest/Green Belt



- (v) In case the project involves diversion of forests land, guidelines under OM dated 20.03.2013 shall be followed and necessary action be taken accordingly.
- (vi) The information shall be provided about the details of the trees to be cut including their species and whether it also involves any protected or endangered species. Measures taken to reduce the number of the trees to be removed should be explained in detail. The details of compensatory plantation shall be submitted. The possibilities of relocating the existing trees shall be explored.
- (vii) Necessary green belt shall be provided on both sides of the highway with proper central verge and cost provision should be made for regular maintenance.
- (viii) Land use map of the study area to a scale of 1: 25,000 based on recent satellite imagery delineating the crop lands (both single and double crop), agricultural plantations, fallow lands, waste lands, water bodies, built-up areas, forest area and other surface features such as railway tracks, ports, airports, roads, and major industries etc. alongwith detailed ground survey map on 1:2000 scale showing the existing features falling within the right of way namely trees, structures including archaeological & religious, monuments etc. if any, shall be submitted.
- (ix) If the proposed route involves tunneling, the details of the tunnel and locations of tunneling with geological structural fraction should be provided. In case the road passes through a flood plain of a river, the details of micro-drainage, flood passages and information on flood periodicity at least of the last 50 years in the area shall be examined and submitted.

Project alignment passing through ESA/ESZ etc

- (x) If the project is passing through/located within the notified ecologically sensitive zone (ESZ) around a notified National Park/Wildlife Sanctuary or in the absence of notified ESZ, within 10 km from the boundary of notified National Park/Wildlife Sanctuary, the project proponent may simultaneously apply for the clearance for the standing committee of NBWL. The EC for such project would be subject to obtaining the clearance from the standing committee of NBWL.

Flora /Fauna

- (xi) Study regarding the animal bypasses/underpasses etc. across the habitation areas shall be carried out. Adequate cattle passes for the movement of agriculture material shall be provided at the stretches passing through habitation areas. Underpasses shall be provided for the movement of Wild animals.
- (xii) Study regarding in line with the recent guidelines prepared by Wildlife Institute of India for linear infrastructure with strong emphasis on animal movement and identifying crossing areas and mitigation measures to avoid wildlife mortality.
- (xiii) If there is a possibility that the construction/widening of road may cause an impact such as destruction of forest, poaching or reduction in wetland areas, examine the impact and submit details.

Alignment

- (xiv) Detailed alignment plan, with details such as nature of terrain (plain, rolling, hilly), land use pattern, habitation, cropping pattern, forest area, environmentally sensitive areas, mangroves, notified industrial areas, sand dunes, sea, rivers, lakes, details of villages, tehsils, districts and states, latitude and longitude for important locations



falling on the alignment by employing remote sensing techniques followed by "ground truthing" and also through secondary data sources shall be submitted.

- (xv) Describe various alternatives considered, procedures and criteria adopted for selection of the final alternative with reasons.
- (xvi) If the proposed route is passing through a city or town, with houses and human habitation on either side of the road, the necessity for provision of bypasses/diversions/under passes shall be examined and submitted. The proposal should also indicate the location of wayside amenities, which should include petrol stations/service centres, rest areas including public conveyance, etc.
- (xvii) Details about measures taken for the pedestrian safety and construction of underpasses and foot-over bridges along with flyovers and interchanges shall be submitted.
- (xviii) The possibility that the proposed project will adversely affect road traffic in the surrounding areas (e.g. by causing increases in traffic congestion and traffic accidents) shall be addressed.
- (xix) If the proposed route is passing through any hilly area, the measures for ensuring stability of slopes and proposed measures to control soil erosion from embankment shall be examined and submitted.
- (xx) In case of river/creek crossing, details of the proposed bridges connecting on either banks, the design and traffic circulation at this junction with simulation studies.
- (xxi) If there will be any change in the drainage pattern after the proposed activity, details of changes shall be examined and submitted.
- (xxii) In case of bye passes, the details of access control from the nearby habitation/habitation which may come up after the establishment of road.
- (xxiii) Details to ensure free flow of water in case the alignment passes through water bodies/river/streams etc.

Recycle/Reuse of Material

- (i) The details of use of fly ash in the road construction, if the project road is located within the 100 km from the Thermal Power Plant shall be examined and submitted.
- (ii) The possibilities of utilizing debris/waste materials available in and around the project area shall be explored.
- (iii) The details on compliance with respect to Research Track Notification of Ministry of Road, Transport and Highways shall be submitted.
- (iv) The details of sand quarry and borrow area as per OM No.2-30/2012-IA-III dated 18.12.2012 on 'Rationalization of procedure for Environmental Clearance for Highway Projects involving borrow areas for soil and earth' as modified vide OM of even No. dated 19th March 2013, shall be examined and submitted.

Data Collection

- (v) Climate and meteorology (max and min temperature, relative humidity, rainfall, frequency of tropical cyclones and snow fall); the nearest IMD meteorological station from which climatological data have been obtained to be indicated.



- (vi) The water bodies including the seasonal ones within the corridor of impacts along with their status, volumetric capacity, quality and likely impacts on them due to the project along with the mitigation measures shall be examined and submitted.
- (vii) The details of water quantity required and source of water including water requirement during the construction stage with supporting data and also classification of ground water based on the CGWA classification, shall be examined and submitted.
- (viii) Accident data and geographic distribution shall be reviewed and analyzed to predict and identify trends - in case of expansion of the existing highway and provide Post accident emergency assistance and medical care to accident victims.

Pollution Control

- (i) The air quality monitoring shall be carried out as per the notification issued on 16th November, 2009. Input data used for Noise and Air quality modelling shall be clearly delineated.
- (ii) The project activities during construction and operation phases, which will affect the noise levels and the potential for increased noise resulting from this project, shall be identified. Discuss the effect of noise levels on nearby habitations during the construction and operational phases of the proposed highway. Identify noise reduction measures and traffic management strategies to be deployed for reducing the negative impact if any. Prediction of noise levels shall be done by using mathematical modelling at different representative locations.
- (iii) The impact during construction activities due to generation of fugitive dust from crusher units, air emissions from hot mix plants and vehicles used for transportation of materials and prediction of impact on ambient air quality using appropriate mathematical model, description of model, input requirement and reference of derivation, distribution of major pollutants and presentation in tabular form for easy interpretation shall be examined and carried out.
- (iv) The details about the protection to existing habitations from dust, noise, odour etc. during construction stage shall be examined and submitted.
- (v) If the proposed route involves cutting of earth, the details of area to be cut, depth of cut, locations, soil type, volume and quantity of earth and other materials to be removed with location of disposal/ dump sites along with necessary permission.
- (vi) If the proposed route is passing through low lying areas, details of filling materials and initial and final levels after filling above MSL shall be examined and submitted.

Safety

- (vii) The details of measures taken during constructions of bridges across rivers/ canals/major or minor drains keeping in view the flooding of the rivers and the life span of the existing bridges shall be examined and submitted. Provision of speed breakers, safety signals, service lanes and foot paths shall be examined at appropriate locations throughout the proposed road to avoid accidents.
- (viii) The details of road safety, signage, service roads, vehicular under passes, accident prone zones and the mitigation measures, shall be submitted.
- (ix) IRC guidelines shall be followed for widening & upgradation of roads.

- (x) Details of blasting if any, methodology/technique adopted, applicable regulations/permissions, timing of blasting, mitigation measures proposed keeping in view mating season of wildlife.

Other Details

- (xi) Rain water harvesting pit shall be at least 3 - 5 m above the highest ground water table. Provisions shall be made for oil and grease removal from surface runoff.
- (xii) The details of social impact assessment due to the proposed construction of the road shall be submitted.
- (xiii) If the proposed project involves any land reclamation, details shall be provided of the activity for which land is to be reclaimed and the area of land to be reclaimed.
- (xiv) Details of the properties, houses, business activities etc likely to be effected by land acquisition and an estimation of their financial losses, shall be submitted.
- (xv) Detailed R&R plan with data on the existing socio-economic status of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternative livelihood concerns/employment and rehabilitation of the displaced people, civil and housing amenities being offered, etc and the schedule of the implementation of the specific project, shall be submitted.
- (xvi) The environment management and monitoring plan for construction and operation phases of the project shall be submitted. A copy of your corporate policy on environment management and sustainable development shall also be submitted.
- (xvii) Estimated cost of the project including that of environment management plan (both capital and recurring) and source of funding. Also, the mode of execution of the project, viz, EPC, BOT, etc, shall be submitted.
- (xviii) Details of litigation pending against the project, if any, with direction/order passed by any Court of Law against the Project should be given.
- (xix) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- (xx) Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry website "<http://moef.nic.in/Manual/Highways>".

GENERAL GUIDELINES

- (i) The EIA document shall be printed on both sides, as far as possible.
 - (ii) All documents should be properly indexed, page numbered.
 - (iii) Period/date of data collection should be clearly indicated.
 - (iv) Authenticated English translation of all material provided in Regional languages.
 - (v) The letter/application for EC should quote the MoEF&CC File No. and also attach a copy of the letter prescribing the TOR.
 - (vi) The copy of the letter received from the Ministry on the TOR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.
- 

- (vii) The final EIA-EMP report submitted to the Ministry must incorporate the issues in TOR and that raised in Public Hearing. The index of the final EIA-EMP report, must indicate the specific chapter and page no. of the EIA-EMP Report where the specific TOR prescribed by Ministry and the issue raised in the P.H. have been incorporated. Questionnaire related to the project (posted on MoEF&CC website) with all sections duly filled in shall also be submitted at the time of applying for EC.
- (viii) Grant of TOR does not mean grant of EC.
- (ix) Grant of TOR/EC to the present project does not mean grant of approvals in other regulations such as the Forest (Conservation) Act 1980 or the Wildlife (Protection) Act, 1972.
- (x) Grant of EC is also subject to Circulars and Office Memorandum issued under the EIA Notification 2006 and subsequent amendments, which are available on the MoEF&CC website: www.envfor.nic.in.
- (xi) The status of accreditation of the EIA consultant with NABET/QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.
- (xii) On the front page of EIA/EMP reports, the name of the consultant/consultancy firm along with their complete details including their accreditation, if any shall be indicated. The consultant while submitting the EIA/EMP report shall give an undertaking to the effect that the prescribed TOR (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4th August, 2009).
- (xiii) While submitting the EIA/EMP reports, the name of the experts associated with/involved in the preparation of these reports and the laboratories through which the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (Please refer MoEF office memorandum dated 4th August, 2009). The project Coordinator of the EIA study shall also be mentioned.
- (xiv) All the TOR points as presented before EAC shall be covered.

5. A detailed draft EIA/EMP report shall be prepared in terms of the above additional TOR and should be submitted to the State Pollution Control Board for Public Hearing. Public Hearing to be conducted for the project in accordance with the provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing shall be conducted based on the TOR letter issued by the Ministry and not on the basis of Minutes of the Meeting available on the website.

6. The project proponent shall submit the detailed final EIA/EMP report prepared as per TOR including issues raised during Public Hearing to the Ministry for considering the proposal for environmental clearance before expiry of validity of ToR.

7. The consultants involved in preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports



prepared by them and data provided by other Organization(s)/Laboratories including their status of approvals etc. vide notification of the MoEF dated 19th July, 2013.

8. The prescribed TOR would be valid for a period of four years for submission of the EIA/EMP Reports.

9. This issues with the approval of Competent Authority.


(Amardeep Raju)
Scientist 'E'

Copy to:

- i. The Member secretary, Bihar State Pollution Control Board, Parivesh Bhawan, Plot No. Ns-B/2 Paliputra Industrial Area, Patliputra, Patna (BIHAR) - 800010.
- ii. The Deputy Director General of Forests (C), Ministry of Environment, Forest and Climate Change, Integrated Regional Office, Bungalow No. A-2, Shyamali Colony, Ranchi – 834002.


(Amardeep Raju)
Scientist 'E'

Annexure 1.3: Compliance to the Term of Rereference (ToR)

Annexure 1.3: Compliance to Terms of Reference (ToR)

The proposed project was granted Terms of Reference vide MoEF&CC File No.10/2/2023-IA.III dated 21st February, 2023. Point-wise compliance to the Terms of Reference issued by MoEF&CC is provided as follows: -

ToR Compliance

S. No.	Term of Reference	Compliance
A. Project Specific Conditions		
i.	The proponent shall carry out a traffic flow study to access inflow of traffic from adjoining areas like airport/urban cities. The detailed traffic planning studies shall include complete design, drawings and traffic circulation plans (taking into consideration integration with proposed alignment and other state roads etc.). Wherever required adequate connectivity in term of VUP (vehicle underpass)/PUP (Pedestrian underpass) needs to be include	Assessment of traffic within the project area has been carried out by DPR Consultant. Details of traffic study and forecast are provided under Section 2.4 of EIA report.
ii.	Road safety audit (along with accident/black spots analysis) by any third-party competent organization at all stages namely at detailed design stage, construction stage and pre opening stage to ensure that the project road has been proposed considering all the elements of road safety.	As per IRC Guidelines, Road Safety audit shall be conducted during detailed design, construction & pre-construction stage & report shall be submitted to the MoEF&CC as part of EC Compliance.
iii.	Provide compilation of road kill data on the wildlife on the existing road (national and state highways in the vicinity of the proposed project. Provide measure to avoid road kills of wildlife by the way of road kill management plan.	Vehicular underpasses are provided at all the crossings. Therefore, no roadkill is likely due to the proposed development.
iv.	Trees with heronry (breeding ground for herons), pelicanary or community nesting of birds like Painted Storks, Ibis, Egrets, Peclican, etc will be identified chainage wise and presented in EIA-EMP	Species, girth size wise list of likely to be affected tree are provided in Annexure 5.8
v.	The Alignment of road should be such that the cutting of trees is kept at bare minimum and for this the proponent shall obtained permission from the competent authorities. Alignment should be also such that it will avoid cutting old and large and heritage trees if any. All such trees should be geo tagged, photographed and detailers be submitted in the EIA-EMP report	About 4568 trees are likely to be felled and tree felling will be restricted only within the construction zone/Corridor of Impact (CoI). Tree felling shall be initiated only after obtaining the necessary permission from competent authority. (Refer Section 5.3.2 of EIA report)
vi.	The proponent shall carry out a comprehensive socio-economic assessment and also impact on biodiversity with emphasis on impact of ongoing land acquisition on the local people living around the proposed alignment. The Social Impact Assessment should have social indicators which can reflect on impact on land acquisition on fertile land. The Social Impact Assessment shall take into consideration of key parameter like people dependency on fertile agriculture land, socio-economic spectrum, impact of the project at local and regional levels.	Demographic details of the project affected districts are provided in Section 4.11 in Chapter 4 of EIA report. Socio-economic study has been conducted by DPR Consultant appointed by NHAI and the Report is provided under additional details
vii.	As per the Ministry's Office Memorandum F. No. 22-65/2017.IA.III dated 30 th Sept 2020, the	The Public Hearing has been conducted for each project affected district and the summary

S. No.	Term of Reference	Compliance
	project proponent, based on the commitments made during the public hearing, shall include all the activities required to be taken to fulfill these commitments in the Environment Management Plan along with cost estimate of these activities, in addition to the activities proposed as per recommendations of EIA studies and the same shall be submitted to the ministry as part of the EIA report. The EMP shall be implemented at the project cost or any other funding sources available with the project proponent.	of the issues raise during along with compliance is provided in table 7.2 of EIA Report. MoM of the public hearing is provided in Annexure 7.1 of EIA Report. Environment Management Plan has been prepared and provided in Annexure 9.1 and detailed budget provisions are provided in Chapter-9 of EIA report.
viii.	In pursuance of Ministry's OM no stated above the project proponent shall add one annexure in the EIA Report indicating all the commitments made by the PP to the public during public hearing and submit it to the Ministry and the EAC.	The Public Hearing has been conducted for each project affected district and the summary of the issues raise during along with compliance is provided in table 7.2 of EIA Report. MoM of the public hearing is provided in Annexure 7.1 of EIA Report.
ix.	The action plan on the compliance of the recommendations of the CAG as per ministry circular No. J-11013/71/2016-IA.I(M), dated 25th October,2017 needs to be submitted at the time of appraisal of the project included in the EIA/EMP Report	Address the compliance point in EIA / EMP Report as per MOEFCC Circular No J-11013/71/2016-IA.I (M) dated 25.10.2017.
x.	Passage for animal movement has to be detailed in the report (if alignment is passing through Forest area).	The proposed alignment is neither passing through nor falling within 10.0 km radius of any eco-sensitive/ protected areas notified under Wildlife Protection Act 1972 and amended thereof.
xi.	A comprehensive for plantation of three rows of native species, as per IRC guidelines, shall be provided. Such plantation will be over and above the compensatory afforestation. Tree species should be same as per the forest type and native to the region. A proper plan for green belt development including financial requirements should be developed by the state forest department and submitted along with EIA-EMP.	Avenue plantation with local species of flowering, shade, medicinal, ornamental & fruit bearing trees shall be done within the available ROW as per IRC SP21:2009 and Green Highways (Plantation & Maintenance) Policy-2015. Budgetary provisions of mitigation measures and tree plantations are provided in Table 9-1 of EIA report.
xii.	The PP shall not use the ground water/surface water without obtaining approval/NoC from CGWA/SGWA as the case may be. The project proponent shall apply to the Central Ground Water Authority (CGWA)/State Ground Water Authority (SGWA)/Competent Authority, as the case may be, for obtaining No Objection Certificate (NOC), for withdrawal of ground water.	The total demand of water for construction phase will be about 1250 KLD . Current water demand is only indicative in nature which shall differ during construction Phase. The demand of water shall be met through surface water sources after obtaining necessary permission.
xiii.	Detailed Biodiversity assessment and conservation mitigation plan be developed by a reputed institute or by team of expert of national repute.	The biological environment of the study area along with list of flora and fauna found in the project area is provided in Section 4.14 of EIA Report. The proposed alignment is neither passing through nor falling within 10.0 km radius of any eco-sensitive/ protected areas notified under Wildlife Protection Act 1972 and amended thereof.

S. No.	Term of Reference	Compliance
xiv.	Rain water harvesting structure be constructed at both sides of the road with special precaution of oil filters and de-silting chambers.	Rainwater Harvesting Structures are proposed on either side at every 500m interval as per IRC SP 42:2014 guidelines and location specific requirements. Typical drawing of proposed RWH structures are provided Figure 5-1 of EIA Report
B. General Conditions		
i.	A brief description of the project, project name, nature, size, its importance to the region/state and the country shall be submitted.	Project description is provided in Chapter 2 of the EIA report.
ii.	Details of any litigation(s) pending against the project and / or any directions or orders passed by any court of law / any statutory authority against the project to be detailed out.	No litigation is pending against the project.
iii.	Bridge design in eco sensitive area /mountains be examined keeping in view the rock classification hydrology etc.	Project follows the plain terrain. The proposed project neither passing through nor falling within 10.0 km radius any protected/eco-sensitive area notified under Wildlife Protection Act 1972 and amended thereof
iv.	Examine the road design standards, safety equipment specifications and Management System training to ensure that design details take account of safety concerns and submit the traffic management plan.	Safety and Traffic management plan shall be as per IRC SP 55:2014.
v.	In case the project involves diversion of forests land, guidelines under OM dated 20.03.2013 shall be followed and necessary action be taken accordingly	~4.1 ha of notified forest (Strip plantation along the existing roads/canals) area shall be diverted for the development of proposed project. Forest diversion proposal is under process.
vi.	The information shall be provided about the details of the trees to be cut including their species and whether it also involves any protected or endangered species. Measures taken to reduce the number of the trees to be removed should be explained in detail. The details of compensatory plantation shall be submitted. The possibilities of relocating the existing trees shall be explored.	About 4568 nos. of trees are likely to be felled within proposed RoW. However, to reduce the number of felling trees, construction shall be limited for construction zone only as per MoRTH& IRC guidelines.
vii.	Necessary green belt shall be provided on both sides of the highway with proper central verge and cost provision should be made for regular maintenance.	Avenue plantation on both side of the project highway and median plantation shall be undertaken as per IRC SP-21:2009. Cost provision for regular maintenance provided in CER & EMP as per NHAI letter no. NHAI/GHD/02/ 01/02-22/2016/50 dated 17 th January 2018 and Green Highways (Plantation & Maintenance) Policy 2015. The detail plan provided as Annexure 5.7 of EIA report.
viii.	Land use map of the study area to a scale of 1: 25,000 based on recent satellite imagery delineating the crop lands (both single and double crop), agricultural plantations, fallow lands, waste lands, water bodies, built-up areas, forest area and other surface features such as railway tracks, ports, airports, roads, and major industries etc. along with detailed ground survey map on 1:2000 scale	Land Use Land Cover map of project area is given in under Annexure 4.1 of the EIA report.

S. No.	Term of Reference	Compliance
	showing the existing features falling within the right of way namely trees, structures including archaeological & religious, monuments etc. if any, shall be submitted.	
ix.	If the proposed route involves tunnelling, the details of the tunnel and locations of tunnelling with geological structural fraction should be provided. In case the road passes through a flood plain of a river, the details of micro-drainage, flood passages and information on flood periodicity at least of the last 50 years in the area shall be examined and submitted.	No tunnel is proposed.
Project alignment passing through ESA/ESZ etc		
x.	If the project is passing through/located within the notified ecologically sensitive zone (ESZ) around a notified National Park/Wildlife Sanctuary or in the absence of notified ESZ, within 10 km from the boundary of notified National Park/Wildlife Sanctuary, the project proponent may simultaneously apply for the clearance for the standing committee of NBWL. The EC for such project would be subject to obtaining the clearance from the standing committee of NBWL.	No notified National Park / Wildlife Sanctuary is located within 10.0 km radius of the project highway. Hence, there is no requirement of clearance from NBWL.
Flora/Fauna		
xi.	Study regarding the animal bypasses /underpasses etc. across the habitation areas shall be carried out. Adequate cattle passes for the movement of agriculture material shall be provided at the stretches passing through habitation areas. Underpasses shall be provided for the movement of Wild animals.	Total 1 Major Bridges, 6 minor bridge, 1 ROB, 2 VUP, 1 LVUP and 28 SVUP are proposed for free passage to villagers & animals and to avoid any impact on local hydrology. The details are provided in Chapter 2 of EIA report.
xii.	Study regarding in line with the recent guidelines prepared by Wildlife Institute of India for linear infrastructure with strong emphasis on animal movement and identifying crossing areas and mitigation measures to avoid wildlife mortality.	No wildlife corridor was found in the vicinity of the project.
xiii.	If there is a possibility that the construction/widening of road may cause an impact such as destruction of forest, poaching or reduction in wetland areas, examine the impact and submit details.	About 4.1 ha of notified forest land along the existing roads shall be diverted for the development of proposed project. The proposed alignment is passing through the strip plantation notified as forest along the existing roads, railway line& canals.
Alignment		
xiv.	Detailed alignment plan, with details such as nature of terrain (plain, rolling, hilly), land use pattern, habitation, cropping pattern, forest area, environmentally sensitive areas, mangroves, notified industrial areas, sand dunes, sea, rivers, lakes, details of villages, tehsils, districts and states, latitude and longitude for important locations falling on the alignment by employing remote sensing techniques followed by "ground truthing" and also through secondary data sources shall be	Details of Physiography, topography, water bodies, land use pattern, habitation, cropping pattern, environmental sensitive location and notified industrial areas are provided in Chapter 4 of EIA Report. Land use Land Cover map of project area is given in under Annexure 4.1 of the EIA report.

S. No.	Term of Reference	Compliance
	submitted.	
xv.	Describe various alternatives considered, procedures and criteria adopted for selection of the final alternative with reasons.	The details of alternative analysis provided in Chapter-3 of EIA report.
xvi.	If the proposed route is passing through a city or town, with houses and human habitation on either side of the road, the necessity for provision of bypasses / diversions / under passes shall be examined and submitted. The proposal should also indicate the location of wayside amenities, which should include petrol stations / service centres, rest areas including public conveyance, etc.	The proposed project is an access-controlled project and alignment has been selected in such a way that, project maintains enough distance from major settlement areas.
xvii.	Details about measures taken for the pedestrian safety and construction of underpasses and foot-over bridges along with flyovers and interchanges shall be submitted.	Traffic control devices and road safety features, including Traffic Signs, Road Markings etc. are proposed and designed as per relevant IRC codes and standards. Details of interchanges are provided in Chapter 2 of the EIA report.
xviii.	The possibility that the proposed project will adversely affect road traffic in the surrounding areas (e.g. by causing increases in traffic congestion and traffic accidents) shall be addressed.	Proposed road is a green field highway, which do not have any adverse effect on existing traffic and surrounding area. On the existing stretches the road is being overpasses. Hence no impact on existing traffic.
xix.	If the proposed route is passing through any hilly area, the measures for ensuring stability of slopes and proposed measures to control soil erosion from embankment shall be examined and submitted.	Project doesn't pass through any hilly area. However, turfing is proposed in high embankment areas to control soil erosion.
xx.	In case of river/creek crossing, details of the proposed bridges connecting on either banks, the design and traffic circulation at this junction with simulation studies.	Details of bridges proposed along the project highway is provide in Chapter 2 of EIA report.
xxi.	If there will be any change in the drainage pattern after the proposed activity, details of changes shall be examined and submitted.	Drainage system has been designed as per IRC SP 42:2014. Cross drainage structures have been provided based on the outcome of hydrology study.
xxii.	In case of bye passes, the details of access control from the nearby habitation / habitation which may come up after the establishment of road.	Project is an greenfield highway project.
xxiii.	Details to ensure free flow of water in case the alignment passes through water bodies/river/streams etc.	Cross drainage structures (bridges and culverts) are proposed on crossing water bodies. Details are provided in Chapter 2 of EIA report.
Recycle/Reuse of Material		

S. No.	Term of Reference	Compliance
i.	The details of use of fly ash in the road construction, if the project road is located within the 100 km from the Thermal Power Plant shall be examined and submitted.	Fly ash shall be taken from Thermal Power Plant based on their availability.
ii.	The possibilities of utilizing debris / waste materials available in and around the project area shall be explored.	Waste material shall be used for land filling in high embankment areas based on their specification.
iii.	The details on compliance with respect to Research Track Notification of Ministry of Road, Transport and Highways shall be submitted.	This project is being compiled all the Guidelines & Notifications issued by MoRTH.
iv.	The details of sand quarry and borrow area as per OM No.2-30/2012-1A-III dated 18.12.2012 on 'Rationalization of procedure for Environmental Clearance for Highway Projects involving borrow areas for soil and earth" as modified vide OM of even No. dated March 19, 2013, shall be examined and submitted.	The quantity of sand quarry or borrow area required (proposed for the project) are given in Section 5.2.2.3 of EIA report. Quarry material shall be arranged from already approved quarries.
Data Collection		
v.	Climate and meteorology (max and min temperature, relative humidity, rainfall, frequency of tropical cyclones and snow fall); the nearest IMD meteorological station from which climatological data have been obtained to be indicated.	The Indian Meteorological Department's (IMD) observatories in vicinity of proposed alignment is located at Muzaffarpur in the State of Bihar. Long-Term climatological data (Years 1981 – 2010) has been analyzed for assessment of prevailing meteorological scenario in the project region. The details of the climate and meteorology of project area are provided in section 4.5.6 of EIA report.
vi.	The water bodies including the seasonal ones within the corridor of impacts along with their status, volumetric capacity, quality and likely impacts on them due to the project along with the mitigation measures, shall be examined and submitted.	The proposed alignment crossing the Gandak River and Canal/nalas. Bridges are proposed on water bodies. Silt fencing shall be installed along the water bodies during construction phase.
vii.	The details of water quantity required and source of water including water requirement during the construction stage with supporting data and also classification of ground water based on the CGWA classification, shall be examined and submitted.	The total demand of water for construction phase will be about 1250 KLD . Current water demand is only indicative in nature which shall differ during construction Phase. The demand of water shall be met through surface sources after obtaining necessary permission.
viii.	Accident data and geographic distribution shall be reviewed and analyzed to predict and identify trends - in case of expansion of the existing highway and provide Post accident emergency assistance and medical care to accident victims.	An Emergency Response Plan shall be prepared by the Contractor for each construction packages and same should be approved by the Monitoring consultant. Arrangements for proper assistance and medical care to the victims shall be done in order to avoid any casualty. (Refer Section 7.5 of EIA report)
Pollution Control		
i.	The air quality monitoring shall be carried out as per the notification issued on 16 th November 2009. Input data used for Noise and Air quality modelling shall be clearly delineated.	The air quality monitoring has been carried out as per the notification issued on 16 th November 2009. Input data used for Noise and Air quality modelling has been defined in section 5.2.5&5.2.3 of EIA report.

S. No.	Term of Reference	Compliance
ii.	The project activities during construction and operation phases, which will affect the noise levels and the potential for increased noise resulting from this project shall be identified. Discuss the effect of noise levels on nearby habitations during the construction and operational phases of the proposed highway. Identify noise reduction measures and traffic management strategies to be deployed for reducing the negative impact if any. Prediction of noise levels shall be done by using mathematical modelling at different representative locations.	The various effects of noise during construction phase on sensitive receptors are provided in section 5.2.5.
iii.	The impact during construction activities due to generation of fugitive dust from crusher units, air emissions from hot mix plants and vehicles used for transportation of materials and prediction of impact on ambient air quality using appropriate mathematical model, description of model, input requirement and reference of derivation, distribution of major pollutants and presentation in tabular form for easy interpretation shall be examined and carried out.	The various impacts on ambient air quality during operation and construction phase are discussed in section 5.2.3.
iv.	The details about the protection to existing habitations from dust, noise, odour etc. during construction stage shall be examined and submitted.	The measures for minimizing the impact of dust, noise and odour includes greenbelt development, dust suppression measures, acoustic enclosures, provision of PPE to the workers, scheduling of activities, etc. The details are provided during construction in Chapter-5 of EIA report.
v.	If the proposed route involves cutting of earth, the details of area to be cut, depth of cut, locations, soil type, volume and quantity of earth and other materials to be removed with location of disposal/ dump sites along with necessary permission.	Details of the material required is given in Table 5-1 and suggested mitigation measures are provided under Section 5.2.2.3 and 5.2.2.4 of EIA report.
vi.	If the proposed route is passing through low lying areas, details of filling materials and initial and final levels after filling above MSL, shall be examined and submitted.	The proposed project is a green field alignment, which passes through the plain area. However, the voids created by excavation shall be backfilled with the excavated soil and level of road is 1.5 m to 2.5 m from the ground level.
safety		

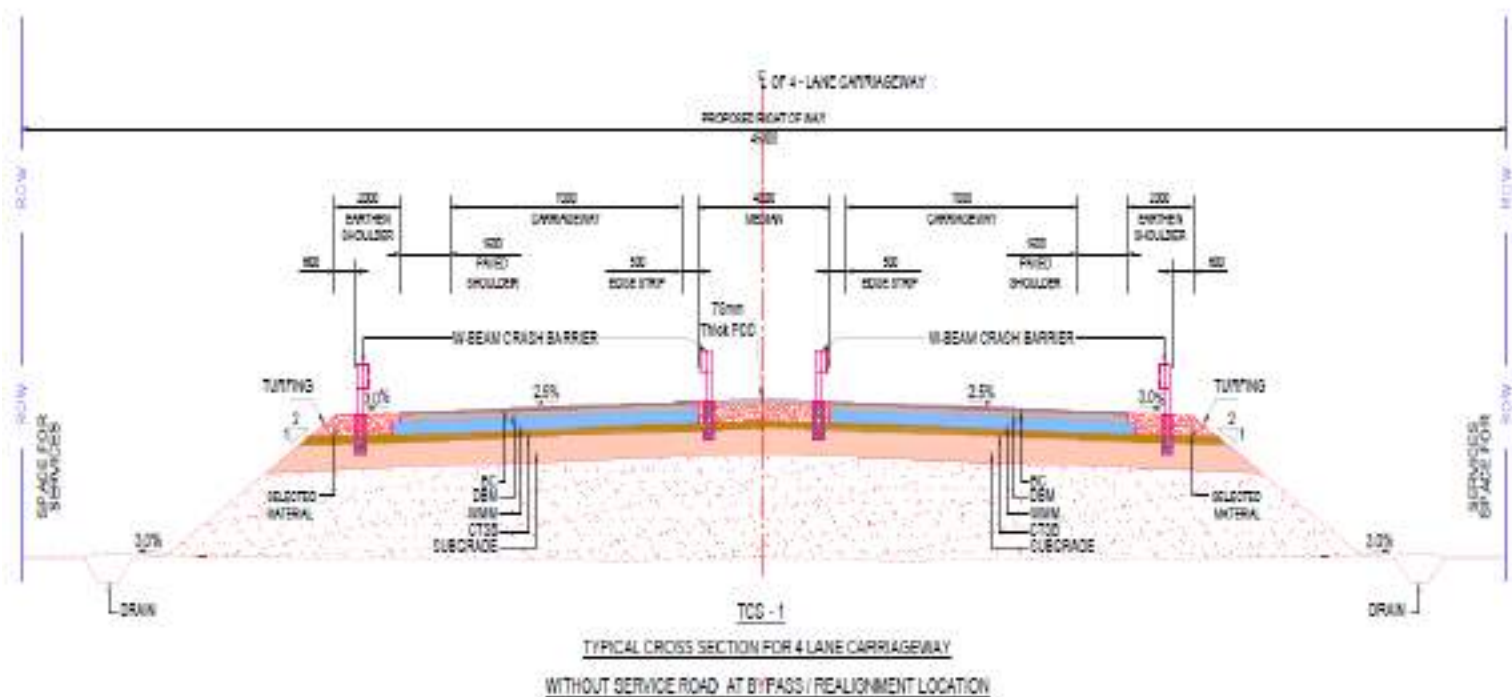
S. No.	Term of Reference	Compliance
vii.	The details of measures taken during constructions of bridges across rivers / canals / major or minor drains keeping in view the flooding of the rivers and the life span of the existing bridges shall be examined and submitted. Provision of speed breakers, safety signals, service lanes and foot paths shall be examined at appropriate locations throughout the proposed road to avoid accidents.	Bridges are designed based on 50 years of rainfall data. Project is Road safety measures shall be provided as per IRC guidelines.
viii.	The details of road safety, signage, service roads, vehicular under passes, accident prone zones and the mitigation measures, shall be submitted.	Traffic control devices and road safety features, including Traffic Signs, Road Markings etc. are proposed and designed as per relevant IRC codes and standards. Along the settlement stretches various no. of underpasses have been suggested.
ix.	IRC guidelines shall be followed for widening & upgradation of roads.	The proposed project is a greenfield National Highway.
x.	Details of blasting if any, methodology/technique adopted, applicable regulations/permissions, timing of blasting, mitigation measures proposed keeping in view mating season of wildlife.	No blasting is proposed for the project.
Other Details		
xi.	Rain-water harvesting pit shall be at least 3 - 5 m above the highest ground water table. Provisions shall be made for oil and grease removal from surface runoff.	Rainwater harvesting structures are proposed on either side at every 500m interval as per IRC 42:2014 guidelines and location specific requirements. Details are provided in Chapter 5 of the EIA Report.
xii.	The details of social impact assessment due to the proposed construction of the road, shall be submitted.	The details of existing scenario of the socio-economic environment are provided in Section 4.9 of EIA report.
xiii.	If the proposed project involves any land reclamation, details shall be provided of the activity for which land is to be reclaimed and the area of land to be reclaimed.	The proposed project will change the land use pattern within the ROW only. The voids created due to borrowing of earth material will be reclaimed in concurrence to landowner or the community.
xiv.	Details of the properties, houses, business activities <i>etc</i> likely to be affected by land acquisition and an estimation of their financial losses, shall be submitted.	The details of the properties, houses, business activities <i>etc</i> . likely to be affected by land acquisition and estimation of their financial losses has been earmarked in Socio Economic Assessment Report.
xv.	Detailed R&R plan with data on the existing socio-economic status of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternative livelihood concerns/employment and rehabilitation of the displaced people, civil and housing amenities being offered, etc and the schedule of the implementation of the specific project, shall be submitted.	The details of the properties, houses, business activities <i>etc</i> . likely to be affected by land acquisition and estimation of their financial losses has been earmarked in SIA Report provided under additional details.
xvi.	The environment management and monitoring plan for construction and operation phases of the project shall be submitted. A copy of your corporate policy on environment management	The details of Environment Management and Environment Monitoring Plan are provided in Annexure 9.1 & 9.2 of the EIA report.

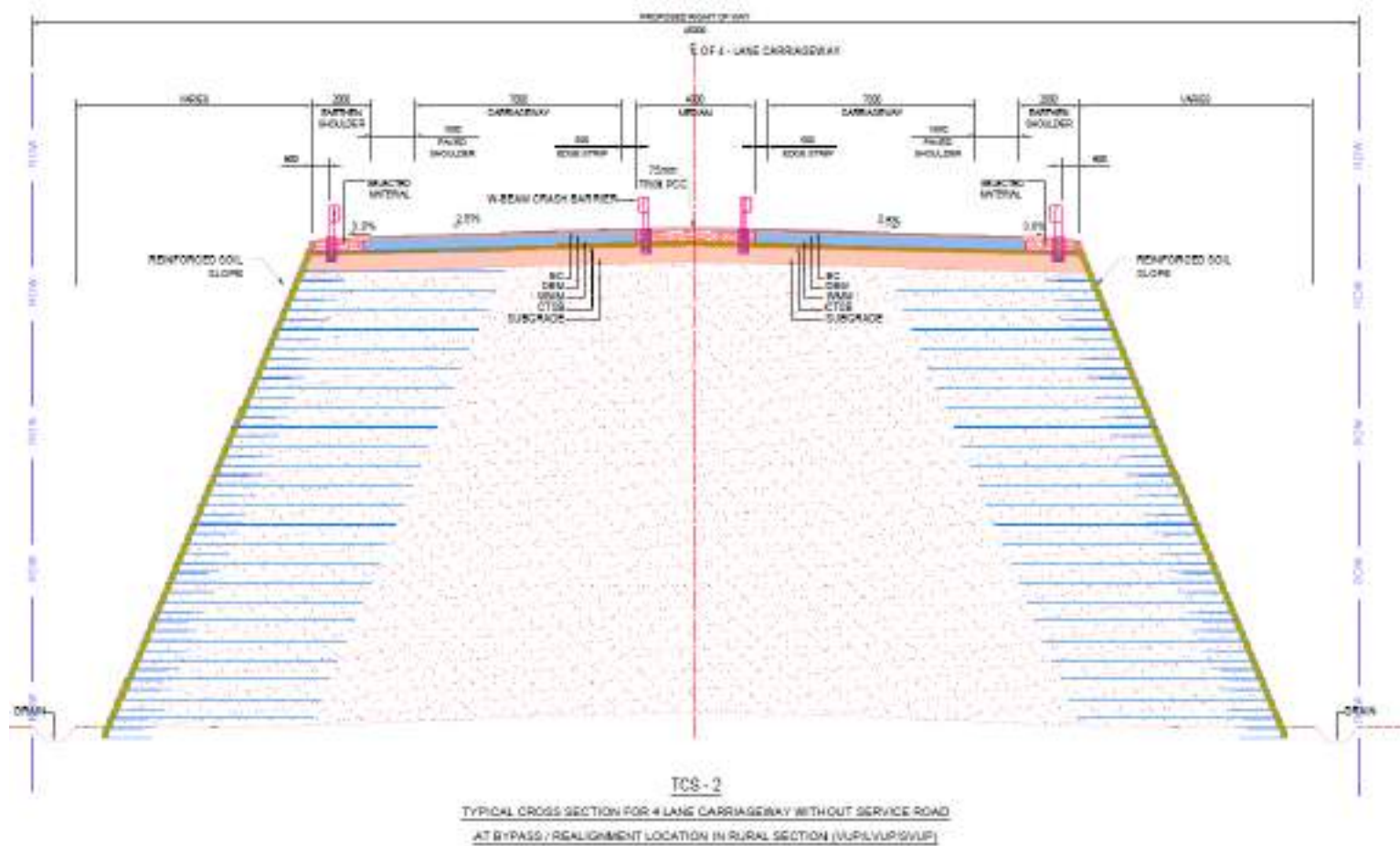
S. No.	Term of Reference	Compliance
	and sustainable development, shall also be submitted.	
xvii.	Estimated cost of the project including that of environment management plan (both capital and recurring) and source of funding. Also, the mode of execution of the project, viz, EPC, BOT, etc, shall be submitted.	Detailed EMP budget has been provide in Chapter 9 of the EIA report.
xviii.	Details of litigation pending against the project, if any, with direction / order passed by any Court of Law against the Project should be given.	No litigation pending against the project.
xix.	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Detailed Environment Management Budget provided in Chapter 9 of EIA report.
xx.	Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry website " http://moef.nic.in/Manual/Highways ".	Noted

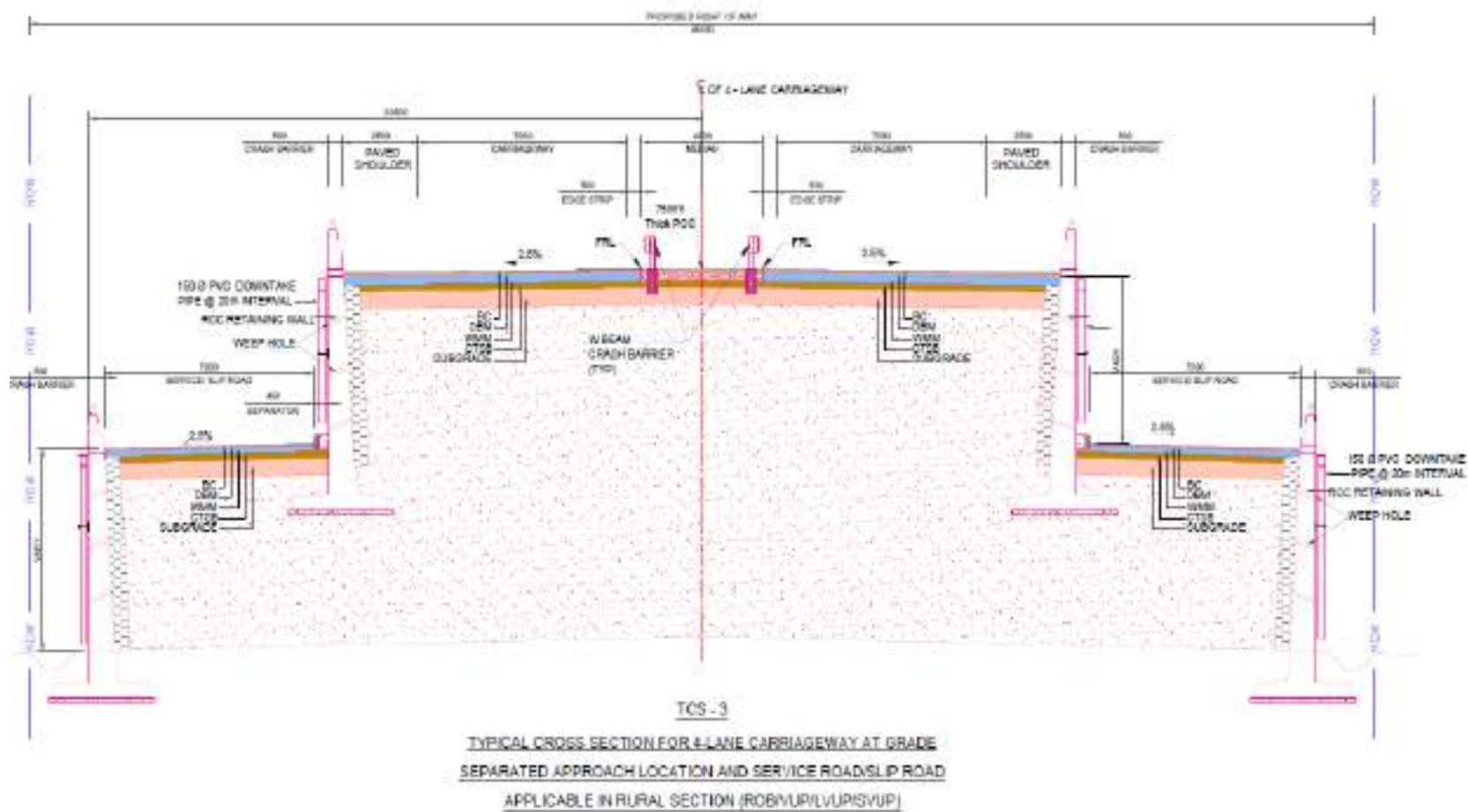
Annexure 2.1: Typical Cross Section (TCS)

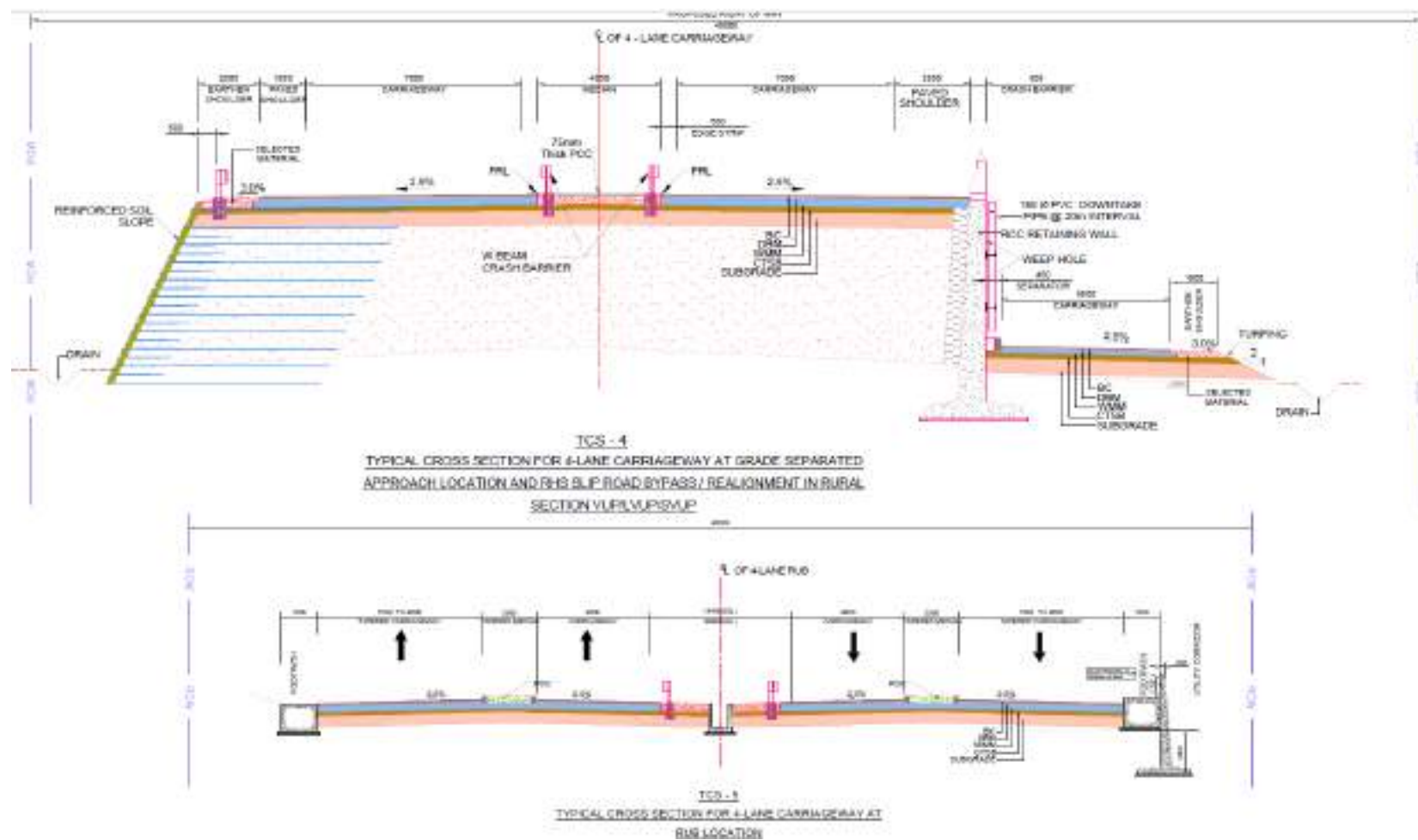
Annexure 2.1: TCS Schedule

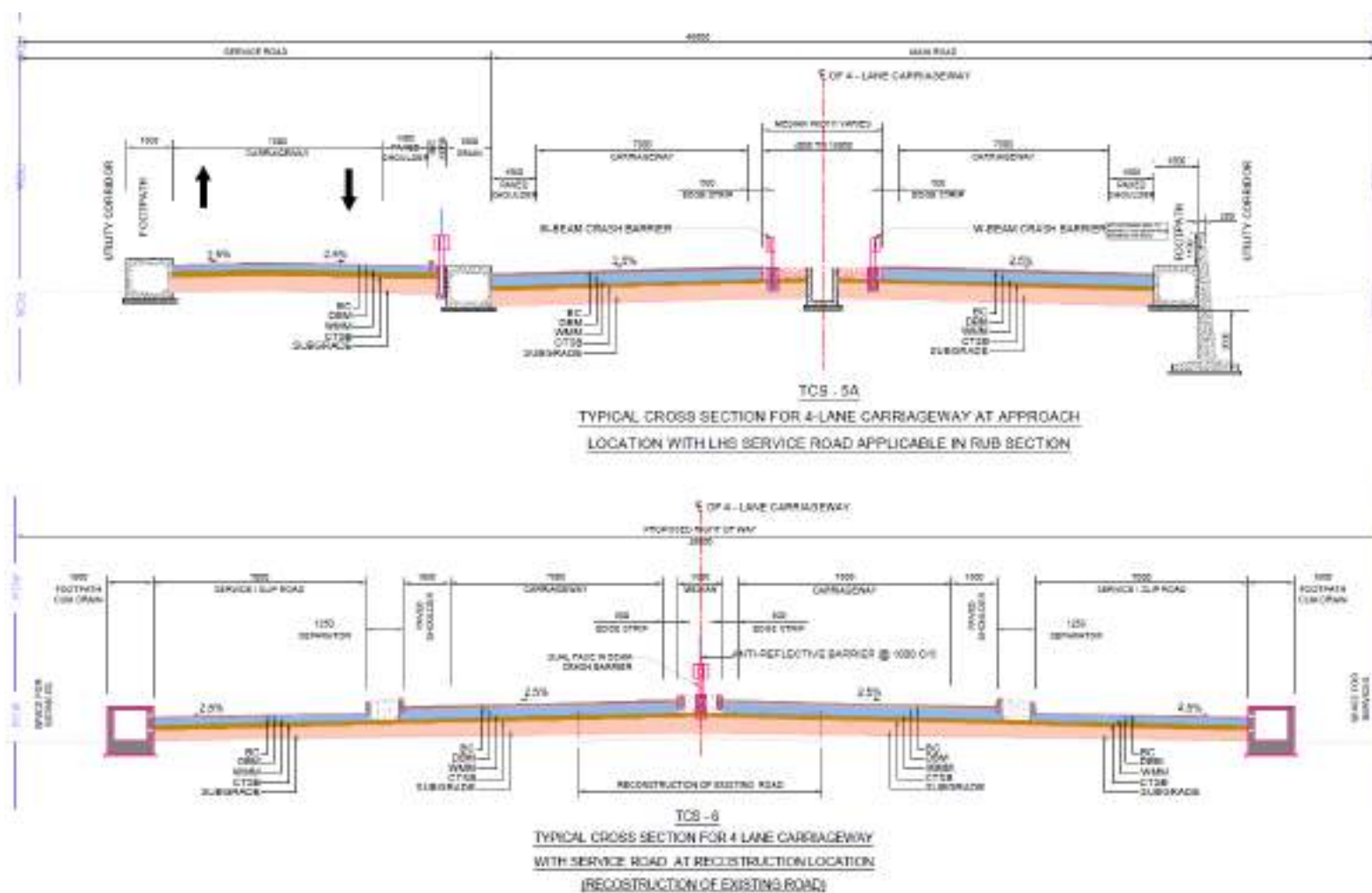
The Typical Cross Sections (TCS) considered for the project road are shown in figures below:

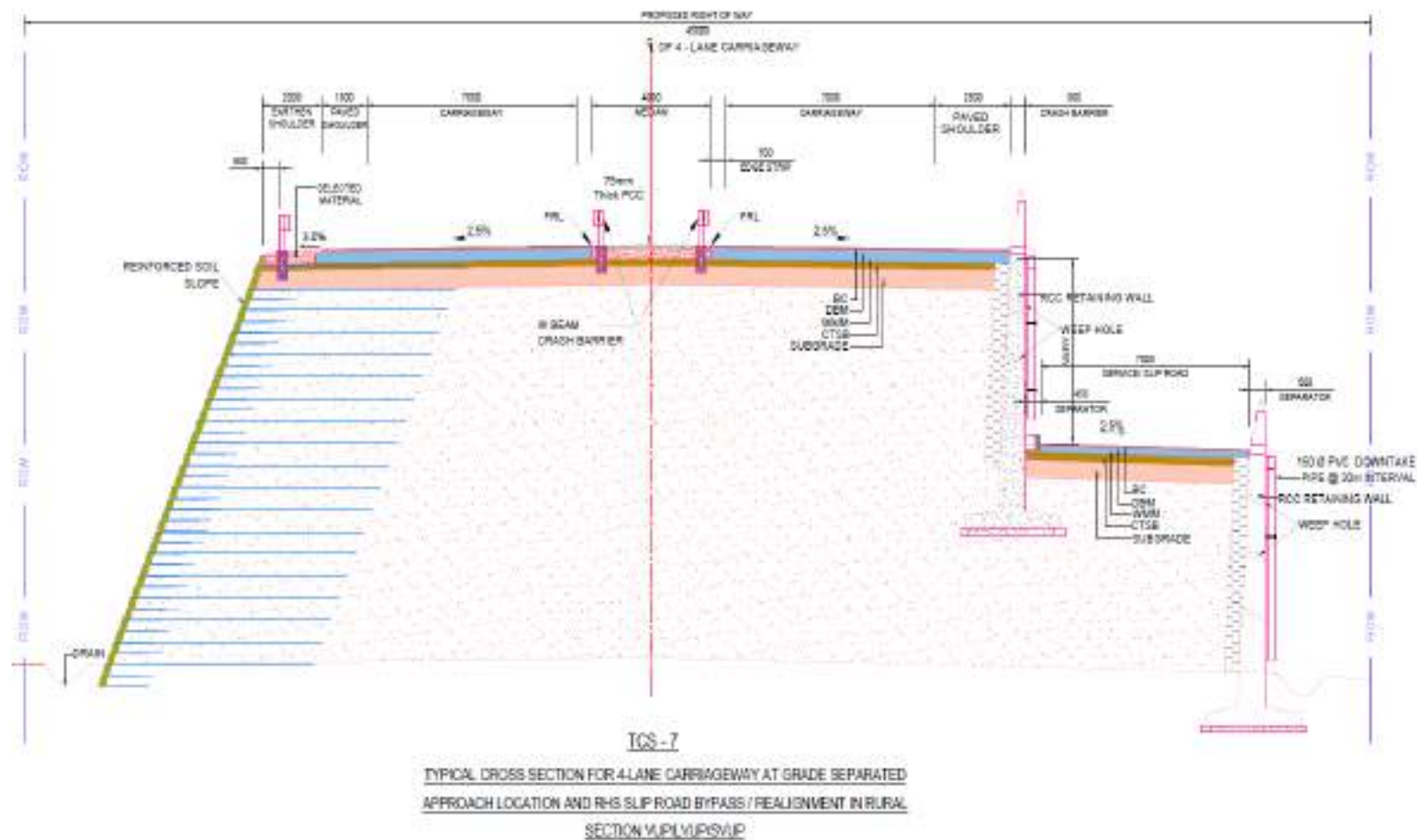


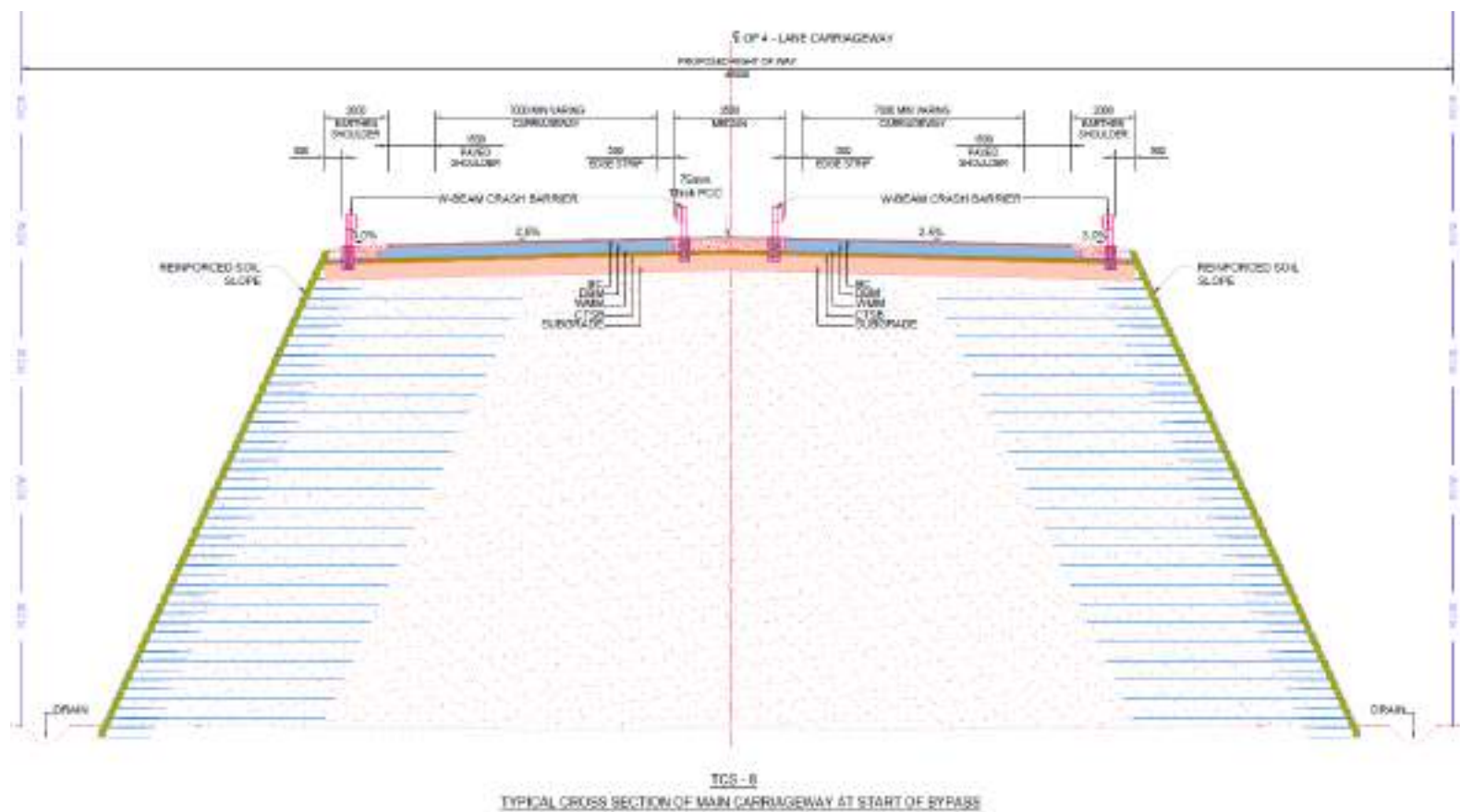


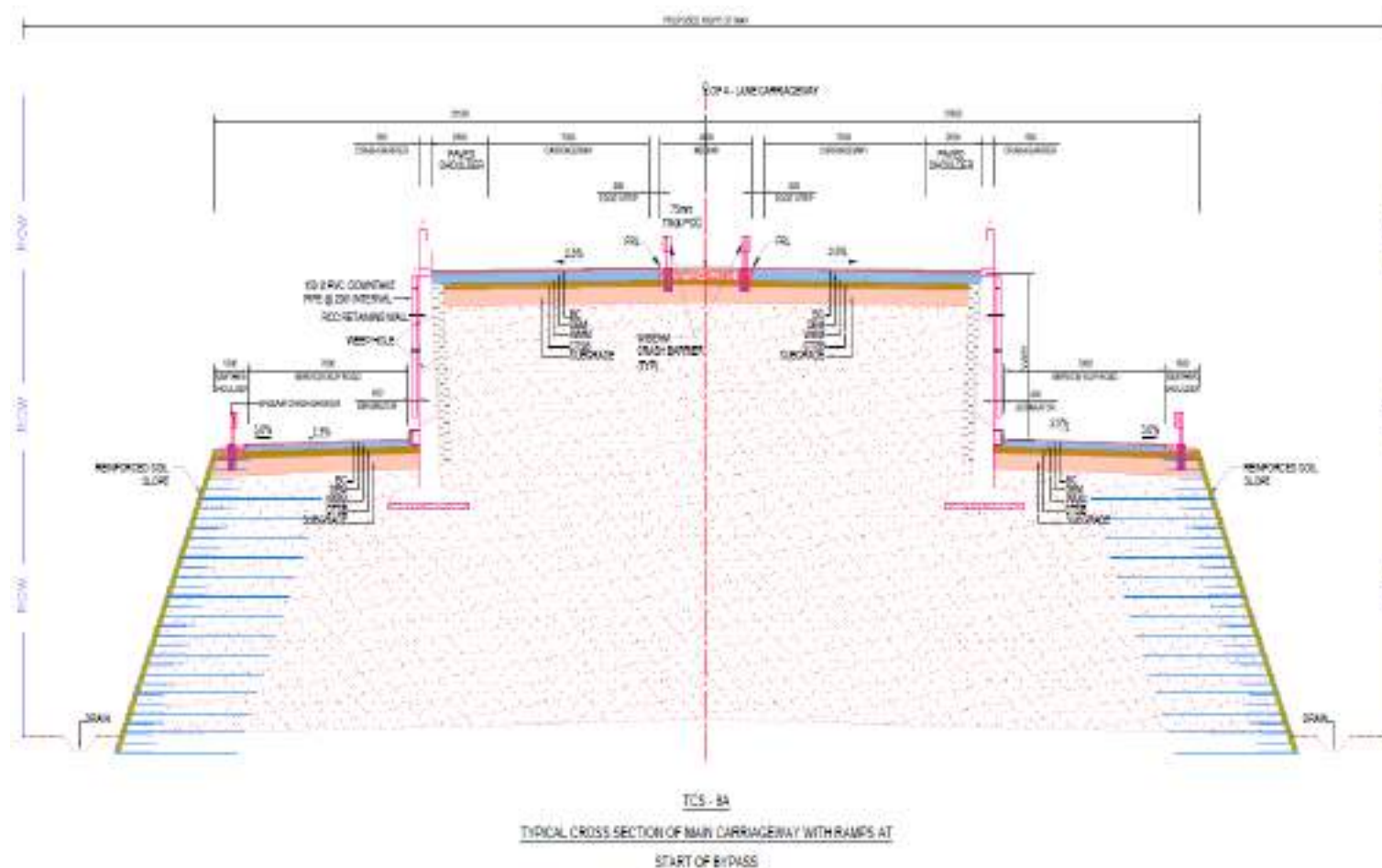


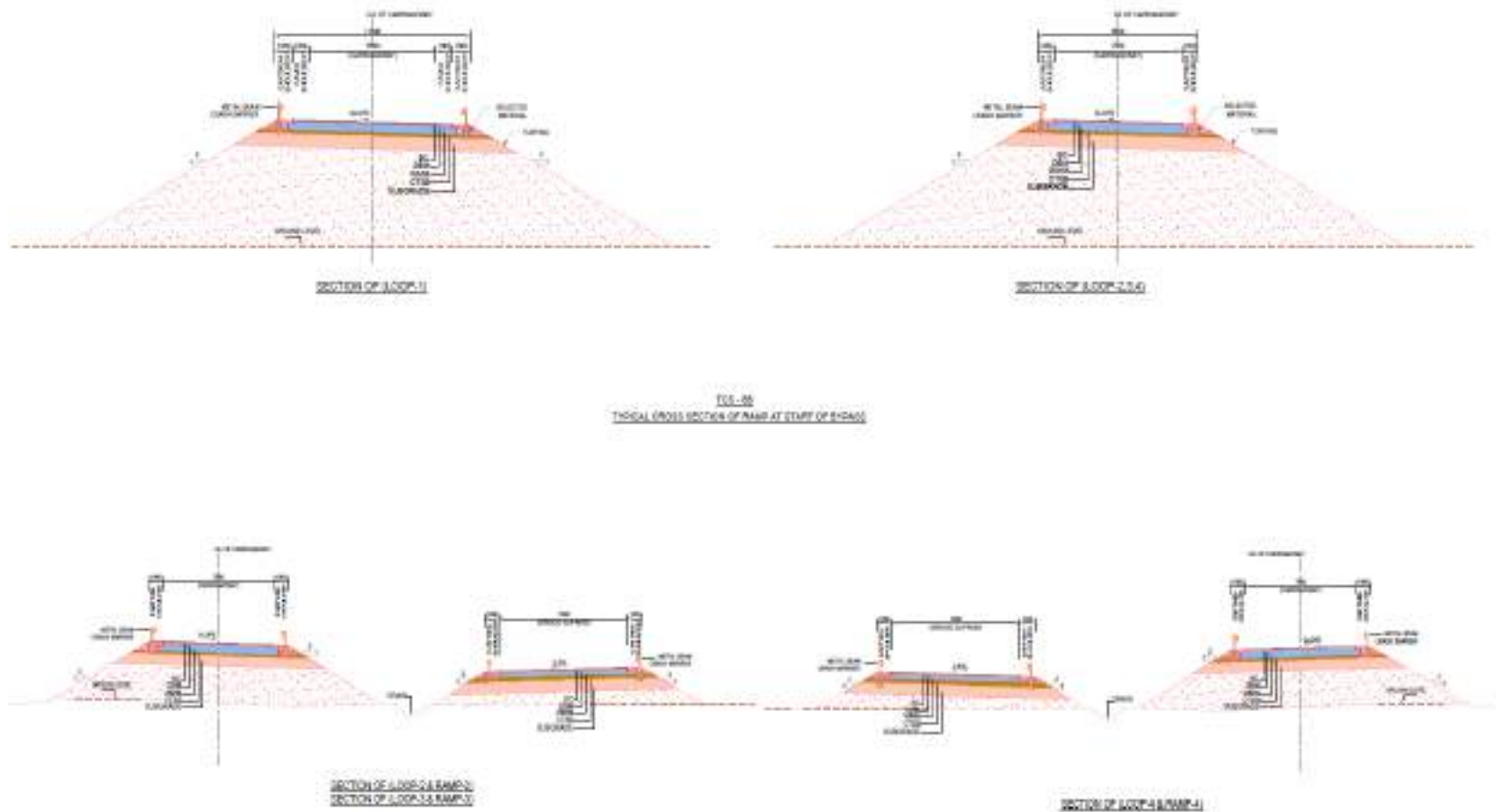












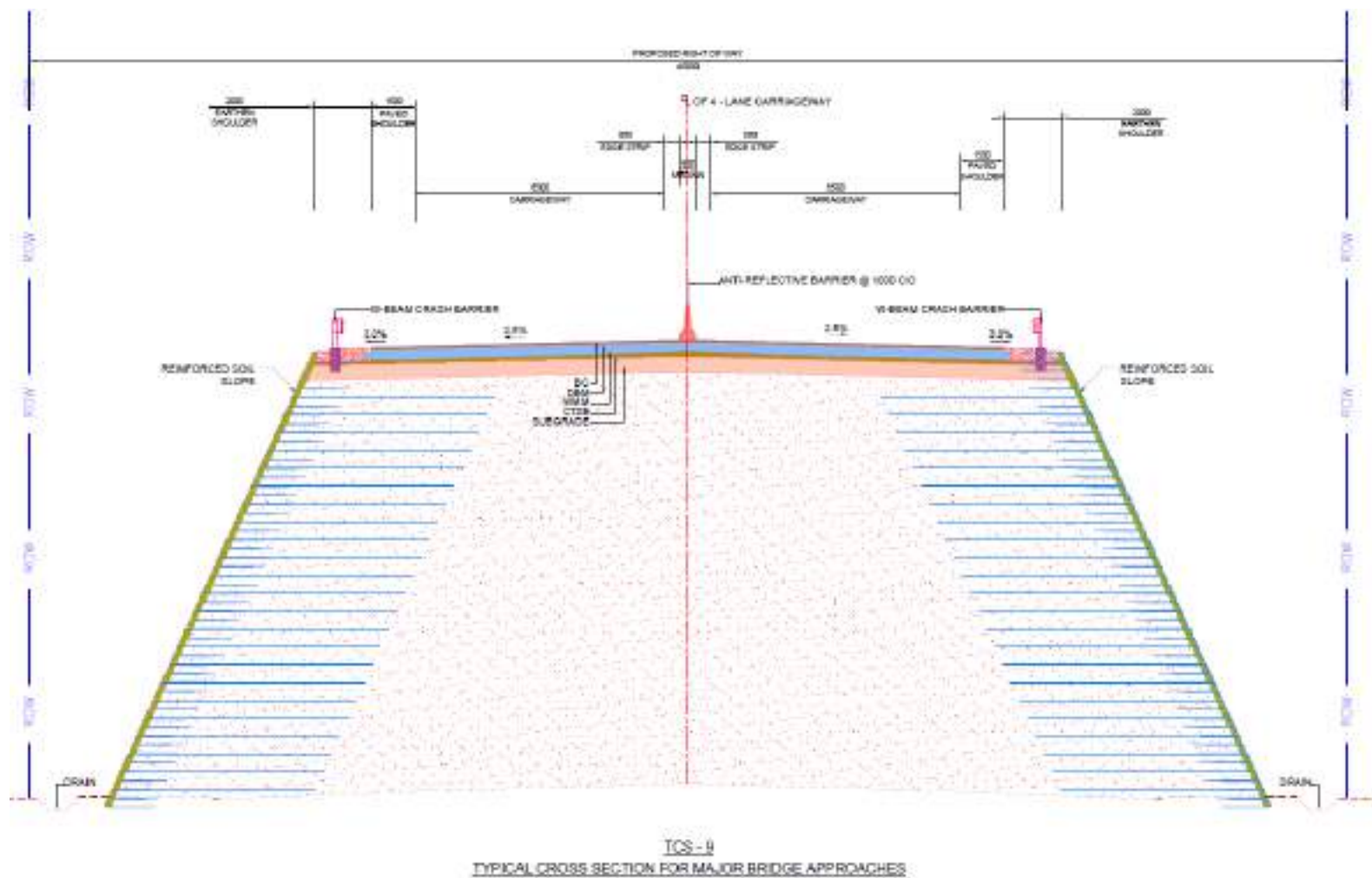
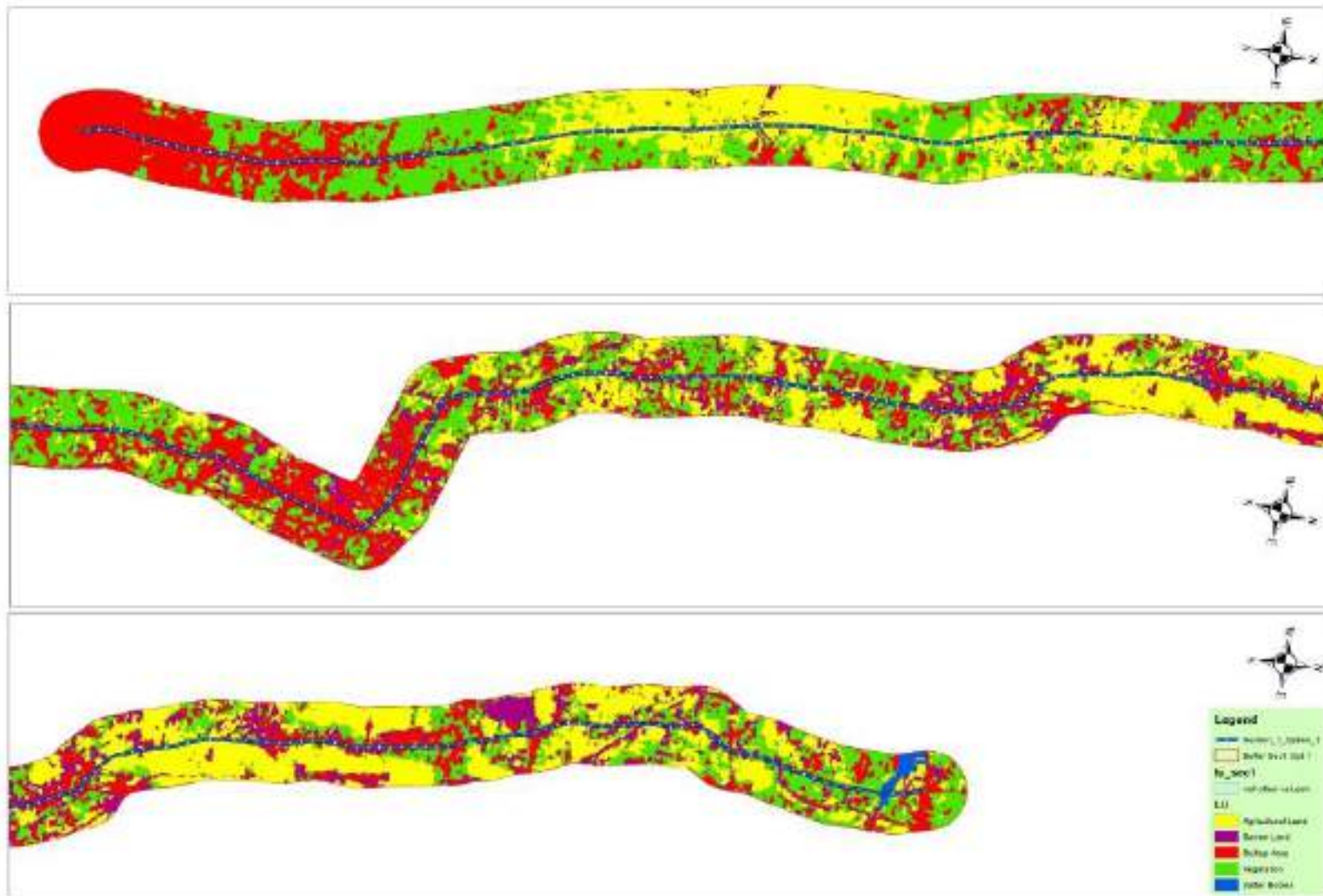


Figure: Typical cross section of the proposed project road

Annexure 4.1: LULC Map

Annexure 4.1: LULC Map



Annexure 5.1: Guidelines for Existing Quarry Management

Annexure 5.1: Guidelines for Existing Quarry Management

The Monitoring Consultant will finalize the locations from the list given by Contractor's/Concessionaire's for procuring materials. The Contractor/Concessionaire shall establish a new quarry only with the prior consent of the Consultant only in cases when: (i) Lead from existing quarries is uneconomical and (ii) Alternative material sources are not available. The Contractor/Concessionaire shall prepare a Redevelopment Plan for the quarry site and get it approved by the consultant.

The construction schedule and operations plans to be submitted to the consultant prior to commencement of work shall contain a detailed work plan for procuring materials that includes procurement, transportation and storage of quarry materials.

CONSTRUCTION STAGE

Development of site: To minimize the adverse impact during excavation of material following measures are need to be undertaken:

- i) Adequate drainage system shall be provided to prevent the flooding of the excavated area
- ii) If the stockpiling locations, the Contractor/Concessionaire shall construct sediment barriers to prevent the erosion of excavated material due to runoff
- iii) Construction of offices, laboratory, workshop and rest places shall be done in the up-wind of the plant to minimize the adverse impact due to dust and noise.
- iv) The access road to the plant shall be constructed taking into consideration location of units and also slope of the ground to regulate the vehicle movement within the plant.
- v) In case of storage of blasting material, all precautions shall be taken as per The Explosive Rules, 1983.

QUARRY OPERATIONS INCLUDING SAFETY

- i) Overburden shall be removed and disposed in line with Guidelines for Debris Disposal Site and management given in Annexure-7.4 & 7.5
- ii) During excavation, slopes shall be flatter than 20 degrees to prevent their sliding. In cases where quarry strata are good and where chances of sliding are less this restriction can be ignored.
- iii) In case of blasting, procedure and safety measures shall be taken as per The Explosive Rules, 1983
- iv) The Contractor/Concessionaire shall ensure that all workers related safety measures shall be done as per guidelines for Workers and Safety.
- v) The Contractor/Concessionaire shall ensure maintenance of crushers regularly as per manufacturer's recommendation.

Topsoil will be excavated and preserved during transportation of the material measures shall be taken to minimize the generation of dust and prevent accidents.

The consultant shall review the quarry site for the management measures during quarry operation, including the compliance to pollution norms.

POST CONSTRUCTION STAGE

- The Contractor/Concessionaire shall restore all haul roads constructed for transporting the material from the quarries to construction site to their original state.
- The Contractor/Concessionaire shall be entrusted the responsibility of reviewing the quarry site for the progress of implementation of Redevelopment Plan.
- The redevelopment of exhaust quarry shall be the responsibility of the agency providing the permit

to ensure the implementation of Redevelopment Plan.

For existing quarry managed directly by a third party / Contractor/Concessionaire from whom the contractor is sourcing the materials, the plan should contain the following:

SI. No.	Item	Unit	Details	Remarks by consultant, if any
1.	Name / identity of the location			
2.	Nearest project road Chainage.			
3.	Name of the owner			
4.	Area involved			
5.	Arrangement with the owner (agreement with the third party / contractor should be attached as an Annexure and should necessarily require the adaptation of good quarry management practices - a description of the requirements should be included)	Cum		
6.	Quantity of material to be withdrawn vis-a-vis the material available			
8.	Machinery & equipment to be used	Cum		
9.	Drainage plans			
10.	Top soil management			
11.	Description of the operating practices			
12.	Health facilities			
13.	Safety provisions made including fire protection systems and the availability of different personal protective equipment			
14.	Copy of the consents to operate from PCB, licences from Mining & Geology, Police & Fire dept should be attached as an Annexure.			
15.	Conditions laid down in the clearances / licenses and plans to ensure compliance			
16.	Monitoring plans for air quality			
17.	Information on whether or not the quarry will be closed under this project. If yes, the proposed closure & restoration plan.			
18.	Photograph of the quarry prior to commencing operations.			
19.	Sketch of the layout of the quarry			

Attach Photograph of Proposed Site, Location Map, consents, licenses and Agreement with land owner

REMARKS

Submitted

Name &Signature

Designation

Contractor/Concessionaire

Checked & Approved

Name &Signature

Designation

Monitoring Consultant

Annexure 5.2: Guidelines for New Quarry Management

Annexure 5.2: Guidelines for New Quarry Management

1. Management Plan for New Quarry

The Contractor/Concessionaire shall prepare a quarry management plan for operation of new quarries and submit it to the Monitoring Consultant for approval and necessary actions. The plan shall consist of the following:

1.1 Selection Details

1.1.1 Location and Layout

Sketch plans and photographs to be provided along with adequate details:

- A map and sketch plan of the area showing the location of the proposed quarry site with respect to the project road, nearby villages, crusher plants and worker accommodation locations along with indicative distances of the different sites from each other and from the road.
- A detailed sketch plan of the quarry area showing approach and haulage roads, location of the rocky outcrops to be quarried, indicating which sites will be quarried in which year or phase, location of stock piles, location of guard house, perimeter fence, location of water sources, amenities, and any further details.
- Photographs of the site

1.1.2 Selection Criteria

- A brief statement as to how the site was chosen.
- Alternative sites that were considered to be mentioned.
- Record any public consultations involved while choosing and what the public concerns were, if any.

1.1.3 Agreement with landowners

- Statement of ownership of the land along with lease / purchase agreements.

1.1.4 Licenses and permits

- Contractor/Concessionaire to state the licences and permits that are necessary for operation, and attach them as appropriate.

1.2 Operation

1.2.1 Method of extraction

- A brief method statement of extraction indicating the techniques to be used, use of explosives if any, if so how are the charges laid, how often the blasting shall be done, etc.
- Appropriate reference should be made to the contractor's safety manual.
- A copy of the operator's licence to handle explosives should be submitted to the Consultant.

1.2.2 Loading and haulage

- Contractor/Concessionaire to describe the process in a few sentences of loading of rocks fragments; means of transportation to the crusher, and from the crusher to the site.

1.2.3 Crusher Plant

- Type, manufacturer, date of manufacture and principal specifications of the plant, details on testing and commissioning (by whom, to what standard, and when).

1.2.4 Storage of explosives

- Contractor/Concessionaire to state where these are to be procured from, where they will be stored and how the supply of explosives will be kept secure (if they are to be kept off site, state what precautions will be given for transportation).

1.2.5 Products

- A list of aggregate sizes and any other products from the quarry. Make sure the sketch map states where these will be stock piled.

1.2.6 Testing and quality assurance

- Refer quality assurance plan of Contractor/Concessionaire if any.
- If not, Contractor/Concessionaire to provide details of sampling frequency, who takes the does the testing, which standards are to be complied with, and any further pertinent details.

1.2.7 Water sourcing

- Contractor/Concessionaire must indicate the operations that shall need water, and its source (an indication on the sketch map will suffice).

1.2.8 Safety

- Contactor to divulge safety measures to the Consultant.
- Ensure that workers at the quarry sites are aware of the appropriate sections of the safety plan.

1.2.9 Workers Accommodation

- Contractor/Concessionaire to provide details of how many workers will be accommodated on site and what the accommodation arrangements and standard will be.

2. Environmental Management

2.1 Environmental Management during Operation

2.1.1 Removal of trees and plants

- Contractor/Concessionaire to describe briefly the floral species that have had to be removed (it will be helpful give local names if English or scientific names are not known), and roughly how many.

2.1.2 Overburden

- Contractor/Concessionaire to state where this will be deposited (indicate on the sketch map), and what methods will be taken to contain it, if any.

2.1.3 Silt management

- Contractor/Concessionaire to state how silt arising from quarry operations will be managed, e.g. provision of a silt retention pond, and show where this is on the sketch map. Say how the silt retention pond will be managed (i.e. how often it will be dredged).

2.1.4 Surface water drainage

- If it will be necessary to provide drainage channels, contractor to show on the sketch map where these are and confirm that they will be kept free of blockages.

2.1.5 Soil and water contamination

- Contractor to list sources of possible contaminants to the soil (fuel stores, etc) and what will be done to control it (minimise spillages, control leaks from plant, etc).

2.1.6 Air pollution

- What are the sources of air pollution?
- Details of air pollution control measures in each case.
- Details of worker protection equipment along with appropriate reference to the safety plan.

2.1.7 Noise

- Sources of noise distance from settlement, labour camp and proposed mitigation to the population / workers exposed.

2.1.8 Traffic

- Impact of quarry operations on traffic and how this may be controlled.

2.1.9 Approach road

- Contractor/Concessionaire to state whether this will be maintained, and if so in what condition.

2.2 Environmental Management at Closure of the site

2.2.1 Dismantling and removal of machinery

- Contractor/Concessionaire to state whether and when this shall be done.

2.2.2 Slope stabilisation and / or protection

- Measures taken to protect the slope and to guard against any possible serious rock fall or any measures to safeguard against hazards like this.

2.2.3 Rehabilitation

- Rehabilitation plan of the quarry.
- The Contractor/Concessionaire shall be responsible for the Redevelopment Plan prior to completion. The Consultant and the NHAI shall be responsible for reviewing this case of redevelopment prior to the issuing the defect liability certificate.

2.2.4 Hand-over

- Terms of hand-over of the quarry site to the owner/authority at the end of its use.

2.2.5 Removal of debris and solid waste

- Confirmation of Contractor/Concessionaire in removal of debris and solid wastes and disposal at a suitable site.

For each aggregate-cum-quarry sand source, the plan should be the same. The table below gives the format:

S. No.	Item	Unit	Details	Remarks by IC, if any
1.	Name / identity of the location			
2.	Nearest project road Chainage.			
3.	Name of the owner			
4.	Area involved	m ²		
5.	Existing land use (verification from land records with revenue department)			
6.	Land use of the area surrounding the proposed site including a map			
7.	Access roads – existing conditions, proposed development and maintenance			
8.	Tree cutting and vegetation clearance if any, along with compensation	Nos.		

S. No.	Item	Unit	Details	Remarks by IC, if any
	measures			
9.	Arrangement with the owner (agreement with land owner should be attached as an Annexure)			
10.	Quantity of material to be withdrawn vis-a-vis the material available	Cum		
11.	Particular areas to be quarried should be clearly identified			
12.	Machinery & equipment to be used			
13.	Drainage plans			
14.	Top soil management			
15.	Description of the operating practices to be adopted.			
16.	Health facilities			
17.	Safety provisions made including fire protection systems and the availability of different personal protective equipment			
18.	Monitoring plans for air, noise and water quality			
19.	Copy of the consents to establish and operate should be attached as an Annexure.			
20.	Copy of the license from Mining & Geology, Police & Fire dept.			
21.	Conditions laid down in the clearances / licenses and plans to ensure compliance			
22.	Information on whether or not the quarry will be closed under this project. If yes, the proposed closure & restoration plan.			
23.	Concerns of the local people living in the immediate / near vicinity should be identified and appropriate measures should be reflected			
24.	Photograph of the quarry prior to commencing operations.			
25.	Sketch of the layout of the quarry			

Attach Photograph of Proposed Site, Location Map, Consents, licenses, safety plan, tree compensation plan, restoration plan, drainage plan, monitoring plan, Agreement with land owner etc. as annexure

Submitted

Signature

Name

Designation

Contractor/Concessionaire

Checked & Approved

Signature

Name

Designation

Monitoring Consultant

Annexure 5.3: Plan for Borrow Area Management

Annexure 5.3: Plan for Borrow Area Management

SITING

Specific locations of borrow areas to be used (if any) will be identified by Contractor/ Concessionaire. In case the Contractor/ Concessionaire wants to open any new borrow areas and then the selection and recommendations for borrow areas will be based on environmental as well as civil engineering considerations. Location of source of supply of material for embankment or sub-grade and the procedure for excavation or transport of material shall be in compliance with the environmental requirements of the MoEF&CC, State Govt. and as specified in IRC:10-1961.

The Contractor/ Concessionaire shall establish a new borrow areas only with the prior consent of the Monitoring Consultant only in cases when:

- Lead from existing borrow area & quarries is uneconomical and
- Alternative material sources are not available.

The Contractor/ Concessionaire shall prepare a Redevelopment Plan for the borrow area and get it approved by the Monitoring Consultant.

Certain precautions have to be taken to restrict unauthorized borrowing by the Contractor/ Concessionaire. No borrow area shall be opened without permission of the Monitoring Consultant. The borrowing shall not be carried out in cultivable lands, unless and until, it shall be agreed upon by the Monitoring Consultant that there is no suitable uncultivable land in the vicinity for borrowing or private landowners are willing to allow borrowing on their fields.

The construction schedule and operations plans to be submitted to the Consultant prior to commencement of work shall contain a detailed work plan for procuring materials that includes procurement; transportation and storage of borrow earth material. The Contractor/ Concessionaire shall provide the following:

- Selection Criteria for Evaluation of Potential Borrow Areas
- A brief statement as to how the site was chosen
- Alternative sites that were considered to be mentioned
- Record any public consultations involved while choosing and what the public concerns were, if any
- Existing land use (Agricultural / Barren / Scrub / grazing / any other type)
- Vegetation / trees to be removed
- Erosion/degradation potential
- Distance and name of the nearest settlement
- Distance from the nearest surface water body
- Drainage pattern of the area
- Distance of the nearest Reserve Forest (if any) or any other ecologically fragile area

- Distance of the nearest Sacred Tree (if any)
- Distance from the nearest school / hospital / primary health center
- Daily / Occasional use of borrow area by the community
- Any schemes or avenues for generation of income for adjoining community
- Location and Layout
- Sketch plans and photographs to be provided along with adequate details:

A map and sketch plan of the area showing the location of the proposed site with respect to the project road, nearby villages and worker accommodation locations along with indicative distances of the different sites from each other and from the road.

Probable Borrow Areas data (to be filled by Contractor/Concessionaire)

Sample no.	Name of Village	Material type	Site identification			Approximate Quantity (Cum)				Available Land / Terrain	Surrounding Land/ Terrain	Remarks
			Nearest Chainage (Km.)	Left / Right	Offset from nearest Chainage (m)	Length (m)	Breadth (m)	Depth (m)	Total (Cum)			

REMOVAL OF TREES AND PLANTS

Contractor/Concessionaire to describe briefly the floral species that have had to be removed (it will be helpful give local names if English or scientific names are not known), and roughly how many.

MITIGATIONS & REHABILITATION OF BORROW AREAS

The soils to be used, as sub-grade, select sub-grade and shoulder materials need to be hauled from designated borrow areas. Similar to the identification of suitable quarries, suitable borrow areas for supply of soil to the new road formation were also identified. Based on the total requirement and availability of each soil type, estimates of soil quantity to be obtained from each of the borrow areas were worked out in accordance with IRC: 10-1961: Recommended Practice for Borrow Pits for Road Embankments constructed by Manual Operation. In the selection of the borrow areas, care was taken to ensure that:

- Sufficient quantity of suitable soil is available from the borrow areas;
- The borrow areas are as close to the project road as possible;
- The loss of productive and fertile agricultural soil is minimum; and
- There is minimum loss of vegetation.

For opening new borrow areas other than those identified the consultant shall follow above section. The borrowing shall not be carried out in cultivable lands, unless and until, it shall be agreed upon by the Consultant that there is no suitable uncultivable land in the vicinity for borrowing, or there are private land owners willing to allow borrowing on their fields.

REHABILITATION

The objective of the rehabilitation programme is to return the borrow pit sites to a safe and secure area, which the general public should be able to safely enter and enjoy. Securing borrow pits sites in a stable condition should be a fundamental requirement of the rehabilitation process. This could be achieved by filling the borrow pit floor to approximately the access road level.

It is important to plan restoration from the outset and coordinate restoration activities. In addition to the bio-diversity issues, land planning considerations are also taken into account when defining a rehabilitation project in order both to preserve the environment and to generate income for the local communities. In this framework rehabilitation often leads to the creation of wetlands and or recreation areas.

Special borrow pit rehabilitation plan shall be specified according to the location and shaping of the mining slopes after exploitation and overburdened dump, with different subsequent uses e.g. forest, meadow, water body etc., the re-greening and replanting methods..

Other criteria which shall be followed for rehabilitation of quarry/ borrow pits are as given below:

- Borrow pits can be backfilled with rejected construction wastes except bitumen and will be given a vegetative cover. If this is not possible, then slopes will be smoothed and depression will be filled in such a way that it looks more or less like the original ground surface.
- During works execution, the Contractor/Concessionaire shall ensure preservation of trees during piling of materials; spreading of stripping material to facilitate water percolation and allow natural vegetation growth; re-establishment of previous natural drainage flows; improvement of site appearance; digging of ditches to collect runoff; and maintenance of roadways where a pit or quarry is declared useable water source for livestock or people nearby. Once the works are completed, and at own expense the Contractor/Concessionaire shall restore the environment around the work site to its original splits.
- Appropriate plant species for the planting programme have to be selected in consultation with ecological consultant and local state forest department. Depending on the limitations on the availability of appropriate plant material, harsh growing conditions (lack of irrigation and hot summer) and ongoing quarry rehabilitation operations there may be substantial loss of plantation and the planting programme may have to be continued for over 3–5 years. As plantings are progressively established they should be monitored before undertaking the next stage to ensure maximum plant survival rates.
- The borrow pit immediate surroundings shall be developed as a low maintenance reserve, with significant areas of native trees and shrubs and areas of longer grass and tussocks forming the open spaces. Walkways around the borrow site may be constructed. Provision for a future drive-in picnic area and car parking area may be developed.

Annexure 5.4: Guidelines for Identification of Debris Disposal Sites & Precautions

Annexure 5.4: Guidelines for Identification of Debris Disposal Sites& Precautions

Guidelines for identification

The locations of dumping sites have to be selected such that:

- No residential areas are located downwind side of these locations,
- Dumping sites are located at least 1000 m away from forest areas and water bodies
- Dumping sites do not contaminate any water sources, rivers etc.
- Dumping sites have adequate capacity equal to the amount of debris generated.
- Public perception about the location of debris disposal site has to be obtained before finalizing the location.

Precautions to be adopted during Dumping of Debris / Waste Material

The Contractor/Concessionaire shall take the following precautions while disposing off the waste material

- During the site clearance and disposal of debris, the Contractor/Concessionaire will take full care to ensure that public or private properties are not damaged / affected and that the traffic is not interrupted.
- The Contractor/Concessionaire will dispose of debris only to the identified places only with prior permission of the Environmental Specialist and the Consultant.
- Contractor can also dispose of the debris for the improvements in public utilities after the proper consent of villagers and approval of Environmental Specialist and the Consultant.
- In the event of any spoil or debris from the sites being deposited on any adjacent land, the Contractor/Concessionaire will immediately remove all such spoil debris and restore the affected area to its original state to the satisfaction of the Environmental Specialist and the Consultant.
- The Contractor/Concessionaire will at all times ensure that the entire existing stream courses and drains within and adjacent to the site are kept safe and free from any debris.
- The Contractor/Concessionaire will utilise effective water sprays during the delivery and handling of materials when dust is likely to be created and to dampen stored materials during dry and windy weather.
- Materials having the potential to produce dust will not be loaded to a level higher than the side and tail boards and will be covered with a tarpaulin in good condition.
- During disposal of debris, proper warning signs to be installed to the satisfaction of Environmental Specialist and the Consultant.
- Any diversion required for traffic during disposal of debris shall be provided with traffic control signals and barriers after the discussion with local people and with the permission of Environmental Specialist and the Consultant.
- During the debris disposal, contractor will take care of surrounding features and avoid any damage to it.
- While disposing debris / waste material, the Contractor/Concessionaire will take into account the wind direction and location of settlements to ensure against any dust problems.
- Adequate arrangements will be made to ensure that the debris / waste material is disposed off nearest to the designated dumping site. The report on this activity shall be prepared regularly by Environmental Specialist and the Consultant.

Annexure 5.5: Guideline for Rehabilitation of Dumpsites & Quarries

Annexure 5.5: Guideline for Rehabilitation of Dumpsites & Quarries

Dumpsites

The dumpsites filled only up to the ground level could be rehabilitated as per guidelines below and to be decided by the consultant

- The dumpsites have to be suitably rehabilitated by planting local species of shrubs and other plants so that the landscape is coherent and is in harmony with its various components.
- In cases where a dumpsite is near to the local village community settlements, it could be converted into a play field by spreading the dump material evenly on the ground. Such playground could be made coherent with the landscape by planting trees all along the periphery of the playground.
- Some of the dumpsites could be used either for plantation or for growing agricultural produce.
- Care should always be taken to maintain the hydrological flow in the area.

Quarries

The Contactor/Concessionaire shall use materials from the existing and licensed quarry areas only. In case any new quarries are opened by the Contactor/Concessionaire, he shall secure permissions for the same and shall follow the rehabilitation plan.

- The objective of the rehabilitation programme is to return the quarry sites to a safe and secure area, which the general public should be able to safely enter and enjoy. Securing quarry sites in a stable condition should be a fundamental requirement of the rehabilitation process. This could be achieved by filling the quarry / quarry floor to approximately the access road level.
- It is important to plan restoration from the outset and coordinate restoration with quarrying activities. In addition to the bio-diversity issues, land planning considerations are also taken into account when defining a rehabilitation project in order both to preserve the environment and to generate income for the local communities. In this framework quarry rehabilitation often leads to the creation of wetlands and natural reserves or recreation areas.
- Special quarry / quarry rehabilitation plan should be specified according to the location and shaping of the mining slopes after exploitation and overburdened dump, with different subsequent uses e.g. forest, meadow, water body etc., and the re-greening and replanting methods.

Other criteria which should be followed for rehabilitation of quarry sites are as given below:

- Quarries will be backfilled with rejected construction wastes and will be given a vegetative cover. If this is not possible, then slopes will be smoothed and depression will be filled in such a way that it looks more or less like the original ground surface.
- During works execution, the Contactor/Concessionaire shall ensure preservation of trees during piling of materials; spreading of stripping material to facilitate water percolation and allow natural vegetation growth; reestablishment of previous natural drainage flows; improvement of site appearance; digging of ditches to collect runoff; and maintenance of roadways where a pit or quarry is declared useable water source for livestock or people nearby. Once the works are completed, and at own expense the Contactor/Concessionaire shall restore the environment around the work site to its original splits.
- To create a safe environment under the terms of The Mines and Quarries Act the faces have to be reduced to a naturally stable slope or be adequately fenced to prevent access to the top and bottom of the faces. Such a fence must be of a height as prescribed under The Mines Act with a barbed wire top strand designed to exclude the public from the quarry area. Depending on the location of the site presence of a permanent lake is considered to be a satisfactory alternative to a fence.

- Appropriate plant species for the planting programme have to be selected in consultation with ecological consultant and local forest department. Depending on the limitations on the availability of appropriate plant material, harsh growing conditions (lack of irrigation and hot summer) and ongoing quarry rehabilitation operations there may be substantial loss of plantation and the planting programme may have to be continued for over 3–5 years. As plantings are progressively established they should be monitored before undertaking the next stage to ensure maximum plant survival rates.

The quarry or quarry immediate surroundings should be developed as a low maintenance reserve, with significant areas of native trees and shrubs and areas of longer grass and tussocks forming the open spaces. Walkways around the quarries may be constructed. Provision for a future drive-in picnic area and car parking area may be developed.

Annexure 5.6: Guidelines for Sediment Control

Annexure 5.6: Guidelines for Sediment Control

All materials shall meet commercial grade standards and shall be approved by the Engineer before being used in the work.

CONSTRUCTION STAGE

Prior to the start of the relevant construction, the Contractor/Concessionaire shall submit to the Consultant for approval, his schedules for carrying out temporary and permanent erosion / sedimentation control works as are applicable for the items of clearing and grubbing, roadway and drainage excavation, embankment / sub-grade construction, bridges and other structures across water courses, pavement courses and shoulders. The Contractor/Concessionaire shall also submit for approval his proposed method of erosion / sedimentation control on service road and quarries and his plan for disposal of waste materials. Work shall not be started until the erosion / sedimentation control schedules and methods of operations for the applicable construction have been approved by the Consultant.

The surface area of erodible earth material exposed by clearing and grubbing, excavation, quarry and fill operations shall be limited to the extent practicable. The Contractor/Concessionaire may be directed to provide immediate control measures to prevent soil erosion and sedimentation that will adversely affect construction operations, damage adjacent properties, or cause contamination of nearby streams or other watercourses. Such work may involve the construction of temporary berms, dikes, sediment basins, slope drains and use of temporary mulches, fabrics, mats, seeding, or other control devices or methods as necessary to control erosion and sedimentation.

The Contractor/Concessionaire shall be required to incorporate all permanent erosion and sedimentation control features into the project at the earliest practicable time as outlined in his accepted schedule to minimize the need for temporary erosion and sedimentation control measures.

Temporary erosion, sedimentation and pollution control measures will be used to control the phenomenon of erosion, sedimentation and pollution that may develop during normal construction practices, but may neither be foreseen during design stage nor associated with permanent control features on the Project.

Where erosion or sedimentation is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion or sedimentation control features can follow immediately thereafter if the project conditions permit; otherwise temporary erosion or sedimentation control measures may be required between successive construction stages. Under no conditions shall a large surface area of erodible earth material be exposed at one time by clearing and grubbing or excavation without prior approval of the Environmental Specialist.

The Consultant may limit the area of excavation, quarry and embankment operations in progress, commensurate with the Contractor's/Concessionaire's capability and progress in keeping the finish grading, mulching, seeding and other such permanent erosion, sedimentation and pollution control measures, in accordance with the accepted schedule.

Temporary erosion is sometimes caused due to the Contractor's/Concessionaire's negligence, carelessness or failure to install permanent controls. Sedimentation and pollution control measures then become necessary as a part of the work as scheduled or ordered by the monitoring consultant, and these shall be carried out at the Contractor's/Concessionaire's own expense. Temporary erosion, sedimentation and pollution control work

required, which is not attributed to the Contractor's/Concessionaire's negligence, carelessness or failure to install permanent control, will be performed as per the need.

Temporary erosion, sedimentation and pollution control may include construction work outside the right of way where such work is necessary as a result of road construction such as quarry operations, service roads and equipment storage sites.

The temporary erosion, sedimentation and pollution control features installed by the Contractor's/Concessionaire's shall be maintained by him till these are needed, unless otherwise agreed by the Consultant.

Annexure 5.7: Tree Plantation strategy

Annexure 5.7: Tree Plantation strategy

1. INTRODUCTION

Due to the proposed development, some of the existing trees are to be felled. To offset this impact, compensatory afforestation programme through tree plantation, median plantation, horticulture and landscaping strategy has been prepared, based upon the experiences of successful implementation of a number of ongoing and completed projects.

2. OBJECTIVE

The main objectives are as follows:

- Reducing the impacts of air pollution
- Natural noise barrier
- Arrest of land erosion
- Providing much needed shade during the day time
- Prevention of vehicle glare from vehicles coming from opposite direction
- Enhancement of aesthetic view of the corridors
- Climatic amelioration
- Defining of ROW especially at sharp curves during night

3. SPECIES SELECTION

Grasses, shrubs and trees are the main species that are readily available in India. Where possible, the use of non-native species should be avoided since they can out compete and displace native plants leading to loss of native biodiversity. To maximise the chances of success, one should try to select species whose growing conditions roughly match the environmental conditions of the project site. Care should also be taken to select species with root systems that match the nature of the soil movement at the project site. Homogenous avenues of trees should be selected for long stretches as it provides aesthetic qualities in the landscaping. One should also take into account the economic and other social benefits while selecting the species for plantation. During the selection of species preference should be given towards rapid growing and pest and disease resistant species. Shrub species, which are dwarf and pollution hardy, are to be planted in the median to prevent the glare of traffic moving in opposite direction. Flowering, ornamentals plants and climbers can also be planted in urban areas to provide beauty. For this purpose, the species may be decided by interaction with local authority and local populace. Few species have also been recommended in the report under section 7.2.2.

4. TASKS OF THE CONTRACTOR/CONCESSIONAIRE

As part of this project implementation, the contractor/concessionaire shall plant and maintain flowering, shade, medicinal, ornamental & fruit bearing trees in suitable area for which cost has been budgeted besides planting and maintenance of ornamental, medicinal & flowering plants and shrubs in the median for which cost has also been budgeted. The specific roles and responsibilities of the Contractor/Concessionaire include:

- Identification of the plantation stretches with NHAI and or Consultant.
- Identification of nursery area and preparation of nurseries
- Planting of saplings in the nurseries during the construction period so that the saplings are a minimum

24 months old

- Replantation of the 2-year-old saplings to the plantation stretches and
- Maintenance for three years including watering, removal of weed, litter and debris from the vicinity of the plantation.
- Ensure the protection of the tree guards provided to the saplings from trampling and browsing by the cattle.

5. GUIDELINES FOR HORTICULTURE PLANTATION AND LANDSCAPING

5.1. General

5.1.1. Scope

Contractor/Consultant to furnish all materials, labour and related items necessary to complete the work indicated on drawing and specified herein.

5.1.2. Materials

Plant Materials

- Plant Materials shall be well formed and shaped true to type, and free from disease, insects and defects such as knots, sun-scaled, windburn, injuries, abrasion or disfigurement.
- All plant materials shall be healthy, sound, vigorous, free from plant diseases, insect's pests, of their eggs, and shall have healthy, well-developed root systems. All plants shall be hardy under climatic conditions similar to those in the locality of the project. Plants supplied shall conform to the names listed on the plant list given in section 7.2.2. Besides these plant species, the Contractor/Concessionaire shall supply other species as desired by the landscaping specialist and or the environmental specialist of the consultant. Under no circumstances non-native species which might have a negative impact on the ecology of the area shall be permitted. No plant material will be accepted if branches are damaged or broken. All material must be protected from the sun and weather until planted.
- Any nursery stock shall have been inspected and approved by the Environmental Specialist of the Consultant.
- All plants shall conform to the requirements specified in the plant list. Except that plants larger than specified may be used if approved, but use of such plants shall not increase the contract price if the use of the larger plant is approved, the spread of roots or ball of earth shall be increased in proportion to the size of plant. Deliver plants with legible identification labels.

Top Soil (Good Earth)

- Topsoil or good earth shall be a friable loam, typical of cultivated topsoil of the locality containing at least 2% of decayed organic matter (humus). It shall be taken from a well-drained arable site. It shall be free of subsoil, stones, earth skins, sticks, roots or any other objectionable extraneous matter or debris. It shall contain no toxic material. No topsoil shall be delivered in a muddy condition. It shall have pH value ranging in between 6 to 8.5.

Fertiliser

- Measurement of sludge shall be in stacks, with 8% reduction for payment. It shall be free from extraneous matter, harmful bacteria insects or chemicals (Subjected to safety norms).

Root System

- The root system shall be conducive to successful transplantation. While necessary, the root-ball shall be

preserved by support with Hessian or other suitable material. On soils where retention of a good ball is not possible, the roots should be suitably protected in such a way that the roots are not damaged.

5.1.3. Condition

Trees and shrubs shall be substantially free from pests and diseases, and shall and shall be materially undamaged. Torn or lacerated roots shall be pruned before dispatch. No roots shall be subjected to adverse conditions such as prolonged exposure to drying winds or subjection to water logging between lifting and delivery.

5.1.4. Supply and Substitution

Upon submission of evidence that certain materials excluding the plant Species prescribed are not available at time of contract, the Contractor/Concessionaire shall be permitted to substitute with an equitable adjustment of price. All substitutions shall be of the nearest equivalent species and variety to the original specified and shall be subjected to the approval of the Environmental Specialist of the Consultant.

5.1.5. Packaging

Packaging shall be adequate for the protection of the plants and such as to avoid heating or drying out.

5.1.6. Marking

Each specimen of tree and shrub, or each bundle, shall be legibly labelled with the following particulars:

- Its name
- The name of the supplier, unless otherwise agreed.
- The date of dispatch from the nursery.

5.2. Plantation Pattern

The type of plantation would be based upon the requirements and the feasibility of the sites along the project corridor. The availability of the space in the RoW is a major guiding factor for landscaping. The plantation pattern to be followed is:

- The first row of plants along the highways will be of small to medium height plants planted at a spacing of 3m c/c and the distance from the second row should be 3m. The second row should be in staggered. The distance from the toe of the embankment should be 1m minimum and the height should be between 1.5m to 2m.
- Flowering shrubs shall be planted in the median in rows as per width availability. Where the width is less than 1.5m grass turfing is to be done. One row of plantation to be done at a spacing of 1.5m c/c.

For special landscaping, embankment slopes and ground cover, herbaceous species to be used. Turfing to be done by grass.

5.3. Tree Planting

5.3.1. Plants and Shrubs

Trees should be supplied with adequate protection as approved. After delivery, if planting is not to be carried out immediately, balled plants should be placed back to back and the ball covered with sand to prevent drying out. Bare rooted plants can be heeled in by placing the roots in prepared trench and covering them with earth, which should be watered into, avoid air pockets round the roots and shrubs shall be planted with the approval of Environmental Specialist of Consultant.

5.3.2. Digging of Pits

Tree pits shall be dug a minimum of three weeks prior to backfilling. The pits shall be 120cms in diameter

and 120cms deep. While digging the pits, the topsoil up to a depth of 30cms may be kept aside, if found good (depending upon site conditions), and mixed with the rest of the soil.

If the side of the below, it shall be replaced with the soil mixture as specified further herein. If the soil is normal it shall be mixed with manure; river sand shall be added to the soil if it is heavy. The bottom of the pit shall be forked to break up the subsoil.

5.3.3. Back Filling

The soil back filled watered through end gently pressed down, a day previous to planting, to make sure that it may not further settle down after planting. The soil shall be pressed down firmly by treading it down, leaving a shallow depression all-round for watering.

5.3.4. Planting

No tree pits shall be dug until final tree position has been pegged out for approval. Care shall be taken that the plant sapling when planted is not be buried deeper than in the nursery, or in the pot. Planting should not be carried out in waterlogged soil. Plant trees at the original soil depth; soil marks on the stem is an indication of this and should be maintained on the finished level, allowing for setting of the soil after planting. All plastic and other imperishable containers should be removed before planting. Any broken or damage roots should be cut back to sound growth.

The bottom of the planting pit should be covered with 50mm to 75mm of soil. Bare roots should be spread evenly in the planting pit; and small mound in the centre of the pits on which the roots are placed will aid on even spread. Soil should be placed around the roots, gently shaking the tree to allow the soil particles to shift into the root system to ensure close contact with all roots and prevent air pockets. Back fill soil should be firmed as filling proceeds, layer by layer, care being taken to avoid damaging the roots. The balance earth shall be filled in a mixture of 1:3 (1 part sludge to 3 part earth by volume) and 50gms potash, (Mop) 50gms of Super Phosphate and 1 Kg. Neem oil cake. Aldrin or equivalent shall be applied every 15 days in a mixture of 5ml in 5 litres of water.

5.3.5. Staking

Newly planted trees must be held firmly although not rigidly by staking to prevent a pocket forming around the stem and newly formed fibrous roots being broken by mechanical pulling as the tree rocks.

The main methods of staking shall be:

- A single vertical stake, 900mm longer than the clear stem of the tree, driven 600mm to 900mm into the soil.
- Two stakes as above driven firmly on either side of the tree with a cross bar to which the stem is attached. Suitable for bare- rooted or Ball material.
- A single stake driven in at an angle at 45 degrees and leaning towards the prevailing wind, the stem just below the lowest branch being attached to the stake. Suitable for small bare- rooted or Ball material
- For plant material 3m to 4.5m high with a single stem a three- wire adjustable guy system may be used in exposed situations.

The end of stake should be pointed and the lower 1 m to 1.2m should be coated with a non-injurious wood preservative allowing at least 150mm above ground level.

5.3.6. Tying

Each tree should be firmly secured to the stake so as to prevent excessive movement. Abrasion must be avoided by using a buffer, rubber or Hessian, between the tree and stake. The tree should be secured at a point just below its lowest branch, and also just above ground level: normally two ties should be used for tree.

These should be adjusted or replaced to allow for growth.

5.3.7. Watering

The Contractor/Concessionaire through the Landscape Contractor should allow for the adequate watering in of all newly planted trees and shrubs immediately after planting and he shall during the following growing season, keep the plant material well-watered

5.3.8. Fertilising

Fertilising shall be carried out by application in rotation of the following fertilisers, every 15 days from the beginning of the monsoon till the end of winter:

- Sludge or organic well-rotted dry farm yard manure: 0.05 cum or tussle.
- Urea 25gm.
- Ammonium sulphate 25gm.
- Potassium sulphate 25gm.

All shrubs, which are supplied pot grown, shall be well soaked prior to planting. Watering in and subsequent frequent watering of summer planted container- grown plants is essential.

5.4. Shrub Planting In Planter Beds

All areas to be planted with shrubs shall be excavated, trenched to a depth of 750mm, refilling the excavated earth after breaking clods and mixing with sludge in ratio 8:1 (8 parts of stacked volume of earth after reduction by 20%: 1 part of stacked volume of sludge after reduction by 8%.)

Tall shrubs may need staking, which shall be provided if approved by the Contracting-consulting engineer, depending upon the conditions of individual plant specimen. For planting shrubs and ground cover shrubs in planters, good earth shall be mixed with sludge in the proportion as above and filled in planters.

Positions of planters shall be planted should be marked out in accordance with the Design drawings. When shrubs are set out, precautions should be taken to prevent roots drying. Planting holes 40cm diameter and 40cm deep should be excavated for longer shrubs. Polythene and other non-perishable containers should be removed and any badly damaged roots carefully pruned. The shrubs should then be set in holes so that the soil level after settlement will be original soil mark on the stem of the shrub. The holes should be back filled to half of its depth and firmed by treading. The remainder of the soil can then be returned and again firmed by treading.

5.5. Grassing

5.5.1. Preparation

During period prior to planting, the ground shall be maintained free from weeds. Grading and preparation of the area shall be completed at least three weeks prior to the actual sowing. Regular watering shall be continued until sowing by dividing the area into portions of approximately 5m squares by constructing small bunds to retain water. These 'bunds' shall be levelled just prior to sowing of grass plants; it shall be ensured that the soil has completely settled.

5.5.2. Soil

The soil itself shall be ensured to the satisfaction of Environmental Specialist Consultant to be a good fibrous loam, rich in humus.

5.5.3. Sowing the grass roots

Grass lines will be used to provide a strong surface cover and will be planted over a well prepared surface.

Slope treatments using grasses will be allowed to establish properly such that the slopes are not subject to undue stress from erosion and mass movement in its initial stages. The sowing of grasses will create a strengthened surface that will reduce the vulnerability to erosion. Median with a width of 1.5m will have only grasses to strengthen the surface. The Contractor/Concessionaire will ensure that the condition of the site is good enough for the successful establishment of grasses.

Grass roots shall be obtained from a grass patch, seen and approved beforehand. The grass roots stock received at site shall be manually cleared of all weeds and water sprayed over the same after keeping the stock in place protected from sun and dry winds. Grass stock received at site may be stored for a maximum of three days. In case grassing for some areas is scheduled for a later date fresh stock of grass roots shall be ordered and obtained.

5.5.4. Execution

Small roots shall be dibbled about 5cms apart into the prepared grounds. Grass will only be accepted as reaching practical completion when germination has proved satisfactory and all weeds have been removed. The Contractor/Concessionaire through the landscape contractor shall supervise all field operations like preparation of surface, sowing of grasses and quality of grasses seeds used.

- Carry out grassing such that a cover of 25 gm of grass seed per sqm of surface is achieved.
- Carry out seed sowing before the onset of monsoon [May & June] so as to achieve the desired results. The watering of the surface will be by tankers till the onset of the monsoon.
- Ensure that a mulch of prepared and dried out herbs is laid over the whole seeded area after sowing, in a thin layer, so that the grass is not affected by direct sunlight and transpiration loss.
- The grasses recommended for are *Cynodon dactylon*, *Cyathocline purpurea*, *Solanum nigrum*, *Xanthium strumarium* etc.

5.5.5. Maintenance

As soon as the grass is approximately a 3cm high it shall be rolled with a light wooden roller - in fine, dry weather - and when it has grown to 5 to 8cms, above to ground weeds must be removed and regular cutting with the scythe and rolling must be begun. A top-dressing of an ounce of guano to the square yard or well decomposed well broken sludge manure shall be applied when the grass is sufficiently secure in the ground to bear the mowing machine, the blades must be raised an inch above the normal level for the first two or three cuttings. That is to say, the grass should be cut so that it is from 4 to 5cms in length, instead of the 3cm necessary for mature grass.

In the absence of rain, in the monsoon, the lawn shall be watered every ten days heavily, soaking the soil through to a depth of at least 20cms. Damage failure or dying back of grass due to neglect of watering especially for seeding out of normal season shall be the responsibility of the Landscaping Contractor. Any shrinkage below the specified levels during the contract or defect liability period shall be rectified at the Landscaping Contractor's expense. The Landscaping Contractor is to exercise care in the use of rotary cultivator and mowing machines to reduce to a minimum the hazards of flying stones and brickbats. All rotary mowing machines are to be fitted with safety guards.

5.5.6. Rolling

A light roller shall be used periodically, taking care that the area is not too wet and sodden.

5.5.7. Edging

These shall be kept neat and must be cut regularly with the edging shears.

5.5.8. Fertilising

The area shall be fed once in a month with liquid manure prepared by dissolving 45gms of ammonium sulphate in 5 litres of water.

5.5.9. Watering

Water shall be applied at least once in three days during dry weather. Watering whenever done should be thorough and should wet the soil at least up to a depth of 20cms.

5.5.10. Weeding

Prior to regular mowing the Landscaping Contractor shall carefully remove rank and unsightly weeds.

5.6. Maintenance of Plants

5.6.1. Cultivating

The Contractor/Concessionaire through the Landscaping Contractor shall maintain all planted areas within contract boundaries for one year until the area is handed over in whole or in phases. Maintenance shall include replacement of dead plants, watering, weeding, cultivating, control of insects, fungus and other diseases by means of spraying with an approved insecticide or fungicide, pruning, and other horticulture operations necessary for proper growth of the plants and for keeping the sub-contract area neat in appearance

5.6.2. Pruning and Repairs

Upon completion of planting work of the sub-contract all trees should be pruned and all injuries repaired where necessary. The amount of pruning shall be limited to the necessary to remove dead or injured twigs and branches and to compensate for the loss of roots and the result of the transplanting operations. Pruning shall be done in such a manner as not to change the natural habit or special shape of trees.

5.6.3. Tree Guards and Protective Fencing

According to local environment, shrubs shall be protected adequately from vandalism until established. Where the tree guards are necessary, care should be taken to ensure that they do not impede natural movement or restrict growth. The specifications of the tree guard proposed are given below:

- The tree guards shall normally be brick in urban and bamboo guards in rural and semi urban areas. The specifications of the cement guards should be as per the relevant IS specification. In certain cases, if required by the Consultant, Circular Iron Tree Guard with Bars shall be provided. The specifications of such tree guard shall be as per relevant IS specification. The Consultant shall spell out in details about the cases where such exception shall be. In absence of any proper specification the decision of the Consultant and or NHAI shall be binding.

5.7. Nursery Stack

Planting should be carried out as soon as possible after reaching the site. Where planting must be a necessity and / or be delayed, care should be taken to protect the plants from pilfering or damage from people / animals. Plants with bare-roots should be heeled-in as soon as received or otherwise protected from drying out, and others set closely together and protected from the wind. If planting is to be delayed for more than a week, packaged plants should be unpacked, the bundles opened up and each group of plants heeled in separately and clearly labelled. If for any reason the surface of the roots becomes dry the roots should be thoroughly soaked before planting.

5.8. Completion

On completion, the ground shall be formed over and left tidy.

6. SPECIAL CONDITIONS AND PARTICULAR SPECIFICATIONS.

- Wherever applicable, work shall be done according to specifications in vogue, at the time of invitation of tender.

- The Plantation area should avoid the stretches within the settlement area and the Ecological Sensitive area.
- The stretches identified should be free from encumbrances and should not lead to impact on any private or community asset. No fresh land acquisition shall be made under the project for the purpose of plantation.
- Contractor/Concessionaire through the Landscaping Contractor shall make his own arrangement for drawing water from there.
- The work included in the schedule of Quantities includes grassing as well as planting of trees and shrubs. The quoted rates shall include execution of these works at different levels and nothing extra shall be paid for any item, for working at these levels
- The Landscaping Contractor shall not be entitled to any compensation for any losses suffered by him and/or revision in the rates originally quoted by him.
 - On account unforeseen delay in commencing the work, whatever the cause of such delays is.
 - On account of reduction in the scope of work.
 - On account of suspension of work, or abandon after award of work.
- The Contractor/Concessionaire shall provide all facilities to Environmental Specialist / Project Engineer and / or his authorized representatives to make frequent inspection of their Nursery and ascertain the process / quality of various categories of trees / plants etc., grown by them.
- The quote rate shall include the cost of transportation of tools and plants to and from the site, including GST. It shall be clearly understood that no claim for any extra payment on account of GST shall be entertained after the opening of the tender.
- The safe custody and up-keep of various categories of plants brought to site is the sole responsibility of the Contractor/Concessionaire and he shall employ sufficient supervisory personnel to ensure the safety of these items.
- The site of work may be handed over to the Contractor/Concessionaire in phases, as soon as the same are available and the Contractor/Concessionaire in turn shall work in these areas forthwith. Nothing extra shall be payable for such phased execution of work.
- While excavating / executing the work the Contractor/Concessionaire shall ensure that the existing cables / pipe lines / structures / fittings are not damaged and if due to his negligence, these are damaged, the same shall be set right with no extra cost to the clients.
- The Contractor/Concessionaire shall co-ordinate his work with other agencies employed by the Clients and ensure that the works of other agencies are not hampered in any way during the duration of contract.
- The Contractor/Concessionaire shall keep the site of works neat and clean during the execution of the work. Any debris found at or near the site of work shall be moved immediately as and when so required by the Environmental Specialist / Project Engineer.
- On completion of the work, the site of work shall be thoroughly cleaned and all debris removed before the work is handed over satisfactorily.
- The Contractor/Concessionaire shall, without any additional charge to the clients, renew or replace any dead or defective plants/grass for a period of 12 months after the certified date of completion.

- "General condition of contract and standard contract Forms of shall also form part of the contract.
- All Tree saplings should be two years (2) years old before they are planted. The numbers of the plants shall be as specified in the schedule of quantities and shall be straight and symmetrical with a crown and having a persistent main stem. The size of crown shall be in good overall proportion to the height of the tree.
- Small trees and shrubs shall be well formed with the crown typical of the species or variety.

General requirements of plants

- Plants shall be typical of their species and variety, well-developed branches, and well foliated with fibrous root system. Plants shall be free from defects and injuries. Plants shall not be pruned before planting.
- Plants shall be free from defects and injuries.
- Plants shall not be freshly dug and nursery grown.
- Nursery grown plants shall have been at least once transplanted
- Bark shall be free from abrasion.
- All trees, soon after planting, shall be properly supported with bamboo stocks to ensure their safety against winds or any other factor, which may affect it adversely.

Protection of "tree to be preserved"

- The Contractor/Concessionaire through the Landscaping Contractor shall be responsible for the protection of tops, trunks and roots of existing trees on site. Existing trees subject to the construction damage shall be boxed, fenced or otherwise protected before any work is started.

General Requirements of Earth Manure and Fertilisers

- EARTH: Good earth shall be agricultural soil of loamy texture, free from kankar, morrum, shingles, rocks, stones, building rubbish and any other foreign matter. The earth shall be free from clods or lumps of sizes bigger than 50mm in any direction. It shall have pH ranging in between 6.5 to 7.5.
- MANURE: Manure shall be of well-decayed organic matter obtained in dry state from the Municipal dump or other similar source approved by the Environmental Engineer/ Project Engineer. The manure shall be free from earth, stone or other extraneous matter. Manure shall be supplied, at site well screened.
- FERTILISER: If the soil tests indicate pH value not as per the above specification namely in between 6.5 to 7.5, following measures need to be taken.
- If pH exceeds 7.5, aluminium sulphate or equivalent fertilizer should be added at the rate of 1 kg per cubic metre to lower the pH by one full point.
- If pH is below 6.5, add ground limestone or equivalent fertilizer at the rate of 1 kg per cubic metre to raise pH by one full point.

7. TEAM FOR THE ASSIGNMENT

The Contractor/Concessionaire is free to recommend a team commensurate with the requirements of the project.

8. DATA TO BE PROVIDED BY THE CLIENT

Client will provide to the Contractor/Concessionaire the map showing settlements and the forest areas

Annexure 5.8: Tree Enumeration List

Effected Trees Detail of Non-forest Land District- Saran / Vaishali / Muzaffarpur (Km. 0.000 to Km 38.813)											
Tree Abstract (BHS Side)											
S.No.	Kilometer	Side	Species Name								
			Local Name of the Species	Botanical Name	0-30	31-60	61-90	91-120	121-150	150 above	Grand Total
1	Km. 0.000 to Km 38.813	BHS Side	Aam	<i>Mangifera indica</i>	16	102	102	172	119	372	883
2			Aamrud	<i>Psidium guajava</i>	21	36	1	2	1	0	61
3			Amla	<i>Phyllanthus emblica</i>	0	10	4	2	0	0	16
4			Amra	<i>Albizia amara</i>	0	1	0	0	0	0	1
5			Arjun	<i>Terminalia arjuna</i>	2	3	10	0	0	0	15
6			Ashok	<i>Saraca indica</i>	9	55	15	7	0	0	86
7			Babul	<i>Acacia nilotica</i>	0	1	0	0	0	0	1
8			Bad	-	0	3	3	2	3	9	20
9			Bankat	-	0	6	1	0	0	0	7
10			Bargad	<i>Ficus benghalensis</i>	1	2	0	0	0	2	5
11			Barhar	-	2	10	6	3	2	0	23
12			Bel	<i>Aegle marmelos</i>	4	4	2	6	0	1	17
13			Ber	<i>Ziziphus mauritiana</i>	0	0	1	0	0	0	1
14			Gagal	-	0	1	3	0	0	0	4
15			Gullar	<i>Ficus racemosa</i>	2	9	16	21	6	3	57
16			Jamun	<i>Syzygium cumini</i>	1	7	2	2	3	0	15
17			Jangali	-	8	191	36	90	25	2	352
18			Kadam	-	6	35	25	19	7	1	93
19			Kari Patta	-	4	0	1	0	0	0	5
20			Karuaim	-	0	1	0	0	0	0	1
21			Kathal	<i>Artocarpus heterophyllus</i>	0	2	1	2	0	4	9
22			Khajur	-	0	10	72	117	52	3	254
23			Lasfasiya	-	2	11	4	0	0	0	17
24			Litchi	-	5	37	108	22	0	1	173
26			Mahua	<i>Madhuca longifolia</i>	0	4	1	5	1	2	13
27			Nariyal	-	0	1	0	2	0	0	3
28			Neem	<i>Azadirachta indica</i>	5	13	5	6	1	0	30
29			Nimbu	-	3	2	1	0	0	0	6
30			Pakar	<i>Ficus virens</i>	0	0	1	2	0	0	3
31			Pani Gamhar	-	0	4	2	3	0	1	10
32			Papdi	-	0	1	0	0	0	1	2
33			Peepal	<i>Ficus religiosa</i>	0	0	0	0	0	6	6
34			Poplar	-	2	41	6	1	0	0	50
35			Sadana	-	0	0	0	1	0	0	1
36			Sagon	<i>Tectona grandis</i>	12	127	69	6	0	1	215
37			Sahjan	-	0	4	0	0	0	0	4
38			Sarifa	-	0	0	1	0	0	0	1
39			Shahtut	-	0	1	0	0	0	0	1
40			Sheesam	<i>Dalbergia sissoo</i>	325	256	11	5	2	1	600
41			Simar	-	28	307	166	109	29	20	659
42			Siris	<i>Albizia lebbeck</i>	1	7	12	5	2	0	27
43			Sitafal	-	0	1	0	0	0	0	1
44			Tad	-	0	2	2	84	201	58	347
45			Taramla	-	0	0	0	0	0	1	1
46			Van Sunder	-	0	1	0	0	0	0	1
Sub Total											4097

List Of Effected Trees Details of Muzaffarpur Forest Division LHS & RHS Sides

Effected Trees Detail of Muzaffarpur Forest Division											
Tree Abstract (LHS Side)											
S. No.	Km.	Side	Species Name		Girth Size						Grand Total
			Local Name of the Species	Botanical Name	0-30	31-60	61-90	91-120	121-150	150 above	
1	(Km. 35+360 - Km. 38+813)	LHS Side	Aam	<i>Mangifera indica</i>	0	4	5	0	1	0	10
2			Aamra	<i>Mangifera indica</i>	0	0	1	0	0	0	1
3			Amla	<i>Phyllanthus emblica</i>	0	0	2	0	0	0	2
4			Badh	<i>Ficus benghalensis</i>	0	0	0	0	1	0	1
5			Bargad	<i>Ficus benghalensis</i>	0	0	0	0	1	3	4
6			Barhad		0	1	0	0	0	0	1
7			Gular	<i>Ficus racemosa</i>	0	1	0	2	0	0	3
8			Gulmohar	<i>Delonix regia</i>	0	0	0	0	0	1	1
9			Jalebi	<i>Pithecellobium dulce</i>	0	0	0	1	0	0	1
10			Kadam	<i>Neolamarckia cadamba</i>	0	0	3	1	0	0	4
11			Karanj	<i>Millettia pinnata</i>	0	0	1	0	0	0	1
12			Kathal	<i>Artocarpus heterophyllus</i>	0	0	0	1	0	0	1
13			Khajoor	<i>Phoenix dactylifera</i>	0	0	0	1	0	0	1
14			Neem	<i>Azadirachta indica</i>	0	1	0	0	0	0	1
15			Nimbu	<i>Citrus limon</i>	1	0	0	0	0	0	1
16			Pipal	<i>Ficus religiosa</i>	0	0	0	0	0	1	1
17			Popular	<i>Populus deltoides</i>	0	0	1	0	0	0	1
18			Sahjan	<i>Moringa oleifera</i>	0	0	0	0	1	0	1
19			Shisham	<i>Dalbergia sissoo</i>	0	2	1	0	0	0	3
20			Semal	<i>Bombax ceiba</i>	0	1	0	0	0	1	2
21			Siris	<i>Albizia lebbeck</i>	1	1	0	0	0	1	3
22			Sitafal	<i>Annona squamosa</i>	0	1	0	0	0	0	1
23			Tad	<i>Borassus</i>	0	0	0	0	0	1	1
24			Van kathal		0	0	1	0	0	0	1
				Sub Total	2	12	15	6	4	8	47

Effectuated Trees Detail of Muzaffarpur Forest Division											
Tree Abstract (RHS Side)											
S.No.	Km.	Side	Species Name		Girth Size						Grand Total
			Local Name of the Species	Botanical Name	0-30	31-60	61-90	91-120	121-150	150 above	
1	(Km. 35+360 - Km. 38+813)	RHS Side	Aam	<i>Mangifera indica</i>	0	3	1	0	0	0	4
2			Amla	<i>Phyllanthus emblica</i>	0	0	0	1	0	0	1
3			Ashok	<i>Saraca asoca</i>	0	3	1	0	0	0	4
4			Bakain	<i>Melia azedarach</i>	0	2	0	0	0	0	2
5			Gular	<i>Ficus racemosa</i>	0	1	0	1	1	1	4
6			Jalebi	<i>Pithecellobium dulce</i>	0	2	0	0	0	0	2
7			Kadam	<i>Neolamarckia cadamba</i>	0	0	2	2	0	1	5
8			Kaner	<i>Cascabela thevetia</i>	1	0	0	0	0	0	1
9			Karanj	<i>Millettia pinnata</i>	0	0	0	1	0	0	1
10			Khajoor	<i>Phoenix dactylifera</i>	0	0	1	3	0	0	4
11			Mahuwar	<i>Madhuca longifolia</i>	0	1	0	0	0	0	1
12			Neem	<i>Azadirachta indica</i>	1	0	1	1	0	0	3
13			Pipal	<i>Ficus religiosa</i>	0	0	1	0	0	0	1
14			Popular	<i>Populus deltoides</i>	0	5	1	3	1	0	10
15			Sagwan	<i>Tectona grandis</i>	0	0	0	1	0	0	1
16			Semal	<i>Bombax ceiba</i>	0	2	5	1	0	0	8
17			Sahjan	<i>Moringa oleifera</i>	0	0	1	0	0	0	1
18			Shisham	<i>Dalbergia sissoo</i>	0	1	1	0	0	0	2
19			Siris	<i>Albizia lebbek</i>	0	2	1	1	0	3	7
20			Sitafal	<i>Annona squamosa</i>	0	1	0	0	0	0	1
21			Tad	<i>Borassus</i>	0	0	0	0	3	1	4
22			Van Kathal		2	2	0	0	0	0	4
				Sub Total	4	25	16	15	5	6	71

List Of Effected Trees Detail of Vaishali Forest Division with LHS & RHS Side

Effected Trees Detail of Vaishali Forest Division											
Tree Abstract (LHS Side)											
S. No.	Km.	Side	Species Name		Girth Size						
			Local Name of the Species	Botanical Name	0-30	31-60	61-90	91-120	121-150	150 above	Grand Total
1	(Km.18+077 - Km. 35+360)	LHS Side	Aam	<i>Mangifera indica</i>	0	0	0	0	0	1	1
2			Akvan/Ankha	<i>Calotropis gigantea</i>	1	0	0	0	0	0	1
3			Ashok	<i>Saraca asoca</i>	0	0	1	0	0	0	1
4			Babool	<i>Vachellia nilotica</i>	1	0	0	0	0	0	1
5			Bargad	<i>Ficus benghalensis</i>	0	0	1	0	0	2	3
6			Barhad		5	0	0	0	0	0	5
7			Gamhar	<i>Gmelina arborea</i>	0	1	1	2	0	0	4
8			Gulmohar		0	0	0	0	3	0	3
9			Jelabi		0	1	0	0	0	0	1
10			Kadam	<i>Neolamarckia cadamba</i>	0	0	0	1	0	0	1
11			Kanel	<i>Nerium oleander</i>	1	0	0	0	0	0	1
12			Karanj	<i>Millettia pinnata</i>	12	5	0	0	0	0	17
13			Khajoor	<i>Phoenix dactylifera</i>	0	0	2	0	0	0	2
14			Lasoda	<i>Cordia dichotoma</i>	5	2	0	0	0	0	7
15			Nimbu	<i>Citrus limon</i>	1	0	0	0	0	0	1
16			Pipal	<i>Ficus religiosa</i>	0	1	1	2	0	3	7
17			Sahjan	<i>Moringa oleifera</i>	2	0	1	0	0	0	3
18			Semal	<i>Bombax ceiba</i>	0	3	2	0	0	0	5
19			Sarifa	<i>Annona squamosa</i>	1	0	0	0	0	0	1
20			Shisham	<i>Dalbergia sissoo</i>	17	5	0	0	0	0	22
21			Tad	<i>Borassus</i>	0	0	0	1	1	0	2
22			Tun	<i>Toona ciliata</i>	0	2	1	1	0	0	4
			Sub Total		46	20	10	7	4	6	93

Effectuated Trees Detail of Vaishali Forest Division											
Tree Abstract (RHS Side)											
S.No.	Km.	Side	Species Name		Girth Size						Grand Total
			Local Name of the Species	Botanical Name	0-30	31-60	61-90	91-120	121-150	150 above	
1	(Km.18+077 - Km. 35+360)	RHS Side	Aam	<i>Mangifera indica</i>	0	1	0	0	0	0	1
2			Amaltas	<i>Cassia fistula</i>	0	0	0	1	0	0	1
3			Amrood	<i>Psidium guajava</i>	1	0	0	0	0	0	1
4			Ashok	<i>Saraca asoca</i>	0	0	1	0	0	0	1
5			Bad	<i>Sterculia foetida</i>	0	0	0	0	0	1	1
6			Bel	<i>Aegle marmelos</i>	0	0	2	0	0	1	3
7			Bankat		1	1	1	0	0	0	3
8			Bargad	<i>Ficus benghalensis</i>	0	0	1	0	1	2	4
9			Barhad		1	0	1	0	0	0	2
10			Chapvan	<i>Quercus chapmanii</i>	0	0	1	0	0	0	1
11			Cut Sagwan		0	0	0	1	0	0	1
12			Flower Tree		1	0	0	0	0	0	1
13			Gulmohar	<i>Delonix regia</i>	0	0	0	1	0	0	1
14			Kadam	<i>Neolamarckia cadamba</i>	0	1	0	0	0	0	1
15			Kaner	<i>Cascabela thevetia</i>	1	0	0	0	0	0	1
16			Karanj	<i>Millettia pinnata</i>	12	37	6	0	1	1	57
17			Khajoor	<i>Phoenix dactylifera</i>	0	0	2	2	0	0	4
18			Lasoda	<i>Cordia dichotoma</i>	2	2	5	0	0	1	10
19			Neem	<i>Azadirachta indica</i>	2	0	0	0	0	0	2
20			Pipal	<i>Ficus religiosa</i>	0	0	1	0	0	0	1
21			Sagon	<i>Tectona grandis</i>	1	0	0	0	0	0	1
22			Sahjan	<i>Moringa oleifera</i>	0	0	0	0	1	0	1
23			Sahtut	<i>Morus alba</i>	0	0	0	1	0	0	1
24			Semal	<i>Bombax ceiba</i>	0	4	0	1	0	0	5
25			Shisham	<i>Dalbergia sissoo</i>	19	1	0	0	0	0	20
26			Siris	<i>Albizia lebbek</i>	0	1	0	1	0	1	3
27			Sitafal	<i>Annona squamosa</i>	3	0	0	0	0	0	3
28			Tun	<i>Toona ciliata</i>	0	0	1	1	0	0	2
			Sub Total		44	48	22	9	3	7	133

List of affected trees Detail of Saran Forest Division Of LHS & RHS Sides

Effectuated Trees Detail of Saran Forest Division											
Tree Abstract (LHS Side)											
S. No.	Km.	Side	Species Name		Girth Size						Grand Total
			Local Name of the Species	Botanical Name	0-30	31-60	61-90	91-120	121-150	150 above	
1	(Km. 0.00 - Km. 18+077)	LHS Side	Arjun	<i>Terminalia arjuna</i>	1	0	0	0	0	0	1
2			Babool	<i>Vachellia nilotica</i>	1	5	1	1	1	0	9
3			Bakain	<i>Melia azedarach</i>	3	1	0	0	0	0	4
4			Chitvan	<i>Alstonia scholaris</i>	0	2	0	0	0	0	2
5			Gamhar	<i>Gmelina arborea</i>	0	1	0	0	0	0	1
6			Green Semal	<i>Bombax ceiba</i>	1	4	0	0	0	0	5
7			Gular	<i>Ficus racemosa</i>	0	0	0	0	1	0	1
8			Jamun	<i>Syzygium cumini</i>	1	0	0	0	0	0	1
9			Jalebi	<i>Pithecellobium dulce</i>	0	0	0	1	0	0	1
10			Lasoda	<i>Cordia dichotoma</i>	0	0	0	1	0	0	1
11			Pani Gamhar	<i>Gmelina arborea</i>	15	6	2	2	0	0	25
12			Pipal	<i>Ficus religiosa</i>	0	1	0	0	0	0	1
13			Sagon	<i>Tectona grandis</i>	0	1	0	0	0	0	1
14			Semal	<i>Bombax ceiba</i>	3	2	0	0	0	0	5
			Sub Total		25	23	3	5	2	0	58

Effectuated Trees Detail of Saran Forest Division											
Tree Abstract (RHS Side)											
S.No.	Km.	Side	Species Name		Girth Size						Grand Total
			Local Name of the Species	Botanical Name	0-30	31-60	61-90	91-120	121-150	150 above	
1	(Km. 0.00 - Km. 18+077)	RHS Side	Arjun	<i>Terminalia arjuna</i>	0	1	0	0	0	0	1
2			Babool	<i>Vachellia nilotica</i>	0	2	0	0	0	0	2
3			Bakain	<i>Melia azedarach</i>	10	3	0	0	0	0	13
4			Chitvan	<i>Alstonia scholaris</i>	0	1	0	0	0	0	1
5			Green Semal	<i>Bombax ceiba</i>	0	2	0	0	0	0	2
6			Gular	<i>Ficus racemosa</i>	1	0	0	0	0	0	1
7			Pani Gamhar	<i>Gmelina arborea</i>	30	3	0	0	0	0	33
8			Pipal	<i>Ficus religiosa</i>	0	0	0	0	0	1	1
9			Sagon	<i>Tectona grandis</i>	6	1	0	0	0	0	7
10			Semal	<i>Bombax ceiba</i>	1	1	0	0	0	0	2
11			Shisham	<i>Dalbergia sissoo</i>	5	1	0	0	0	0	6
			Sub Total		53	15	0	0	0	1	69

Annexure 5.9: Traffic Control and Safety during Construction

Annexure 5.9: Traffic Control and Safety during Construction

A. TRAFFIC MANAGEMENT PRACTICES

The traffic on roads has increased manifold and most of the roads are expected to operate at their maximum capacity in the near future. Under the circumstances, the existing methods of maintenance and construction which compromise safety and cause delay are no longer acceptable and a change in work procedures and method has become inevitable. Under the existing method of maintenance and reconstruction, the traffic is invariably diverted over unprepared shoulders or forced to use part of the existing roads under maintenance. This results in the increase in vehicle operating cost and reduction in safety besides causing environmental pollution. Therefore, the existing work procedure and contract conditions are required to be changed to provide for proper management of traffic during the execution of work. The traffic management strategies to be used at traffic control zones must include the following fundamental principles:

- (i) Make traffic safety an integral and high priority element of every project
- (ii) Avoid inhibiting traffic as much as possible
- (iii) Guide drivers in a clear and positive way
- (iv) Perform routine inspection of traffic control elements and traffic operations
- (v) Give care and attention to roadside safety

B. TRAFFIC CONTROL DEVICES

The primary traffic control devices used in work zones are signs, delineators, barricades, cones, pylons, pavement markings and flashing lights. The following general rules should apply to all traffic control devices within the traffic control zone.

- (i) **Comprehension:** All traffic control devices should be capable of being easily understood. A particular device must convey one and only one meaning. Good and clean condition of the device aids comprehension.
- (ii) **Visibility and Stability:** Devices should be within the cone of vision of the driver and be placed such that it allows adequate time at the average approach speed or the desired speed through the traffic control zone. All traffic control devices should be clearly visible by day and night, at these speeds and under the usually prevailing climatic conditions. They should be kept properly aligned and legible at all times. Foliage or any other obstruction should not be allowed to impede the view of these devices, nor should wind, road dirt or the like be allowed to obscure their face. The traffic control devices must be able to resist the local wind pressure, rain and the vibrations etc. of the passing traffic but these should not act as rigid obstacles in the event of a collision;
- (iii) **Installation and Removal:** All traffic control devices should be installed for the minimum required time. Traffic control devices by their nature are a hindrance to the normal traffic flow and should be removed immediately after the need, being met by these is fulfilled. Existing devices like signs or lane markings should be removed during the temporary works and reinstated thereafter or covered while the temporary devices are in operation. The installation and removal of the temporary traffic control devices and the reinstatement of the pre-existing or new (where the scheme improves the road) traffic control devices must, therefore, be meticulously supervised to ensure the minimum period when there are no signs or markings

C. SIGNS

The road construction and maintenance signs fall into the same three major categories as do other traffic signs, that is Regulatory Signs, Warning Signs and Direction (or Guidance) Signs. The IRC: 67 (Code of Practice for Road Signs) provides a list of traffic signs. Where possible, the size, colours and placement of sign shall conform to IRC: 67. This also covers signs that are not included in IRC: 67 but are considered desirable to aid drivers' comprehension of the route through the road works. Each sign should be well located so that its message is seen and is clear, which will be assisted if the surroundings are devoid of "unnecessary" signs and other clutter. These signs should be of retroreflective sheets of high intensity grade or engineering grade depending upon the importance of the road as directed by the Engineer.

Annexure 5.10: Guidelines for Sitting and Layout of Construction Camp

Annexure 5.10: Guidelines for Sitting and Layout of Construction Camp

SITING

The Contractor/Concessionaire based on the following guidelines shall identify the location of the construction site. The construction site shall be located:

- The construction camps will be located at least 500 m away from habitations at identified sites. The living accommodation and ancillary facilities for labour shall be erected and maintained to standards and scales approved by the Environmental Specialist of Consultant.
- On non-agricultural lands, as far as possible
- Not within 1000m of either side of locations of Forest areas.
- All sites used for camps must be adequately drained. They must not be subject to periodic flooding, nor located within 300 feet of pools, sink holes or other surface collections of water unless such water surface can be subjected to mosquito control measures.
- The camps must be located such that the drainage from and through the camps will not endanger any domestic or public water supply.
- All sites must be graded, ditched and rendered free from depressions such that water may get stagnant and become a nuisance.

(B) LAYOUT

A conceptual layout of a typical construction site has been presented in Figure A. The Contractor/Concessionaire during the progress of work will provide, erect and maintain necessary (temporary) living accommodation and ancillary facilities for labour to standards and scales approved by the engineer. All temporary accommodation must be constructed and maintained in such a fashion that uncontaminated water is available for drinking, cooking and washing. Safe drinking water should be provided to the dwellers of the construction camps. Adequate washing and bathing places shall be provided, and kept in clean and drained condition. Construction camps are to be sited away from vulnerable people and adequate health care is to be provided for the work force.

Sanitation Facilities: Construction camps shall be provided sanitary latrines and urinals. Sewerage drains should be provided for the flow of used water outside the camp. Drains and ditches should be treated with bleaching powder on a regular basis. The sewage system for the camp must be properly designed, built and operated so that no health hazard occurs and no pollution to the air, ground or adjacent watercourses takes place. Compliance with the relevant legislation must be strictly adhered to. Garbage bins must be provided in the camp and regularly emptied and the garbage disposed off in a hygienic manner

Shelter at Workplace: At every workplace, there shall be provided free of cost, four suitable shelters, two for meals and two others for rest, separately for use of men and women labourers. The height of shelter shall not be less than 3m from floor level to lowest part of the roof. Sheds shall be kept clean and the space provided shall be on the basis of at least 0.5m² per head.

Canteen Facilities: A cooked food canteen on a moderate scale shall be provided for the benefit of workers wherever it is considered necessary. The Contractor/Concessionaire shall conform generally to sanitary requirements of local medical, health and municipal authorities and at all times adopt such precautions as may be necessary to prevent soil pollution of the site.

First aid facilities: At every workplace, a readily available first-aid unit including an adequate supply of sterilized dressing materials and appliances will be provided as per the Factory Rules. Workplaces remote and far away from regular hospitals will have indoor health units with one bed for every 250 workers. Suitable transport will be provided to facilitate taking injured and ill persons to the nearest hospital. At every workplace an ambulance room containing the prescribed equipment and nursing staff will be provided.

Health Care Facilities: Health problems of the workers should be taken care of by providing basic health care facilities through health centres temporarily set up for the construction camp. The health centre should

have at least a doctor, nurses, duty staff, medicines and minimum medical facilities to tackle first-aid requirements or minor accidental cases, linkage with nearest higher order hospital to refer patients of major illnesses or critical cases.

The health centre should have MCW (Mother and Child Welfare) units for treating mothers and children in the camp. Apart from this, the health centre should provide with regular vaccinations required for children.

Day Crèche Facilities: At every construction site, provision of a day crèche shall be worked out so as to enable women to leave behind their children. At construction sites where 20 or more women are ordinarily employed, there shall be provided at least a hut for use of children under the age of 6 years belonging to such women. Huts shall not be constructed to a standard lower than that of thatched roof, mud walls and floor with wooden planks spread over mud floor and covered with matting. Huts shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean. There shall be two maidservants (or aayas) in the satisfaction of local medical, health, municipal or cantonment authorities. Where the number of women workers is more than 25 but less than 50, the Contractor/Concessionaire shall provide with at least one hut and one maidservant to look after the children of women workers. Size of crèches shall vary according to the number of women workers employed.

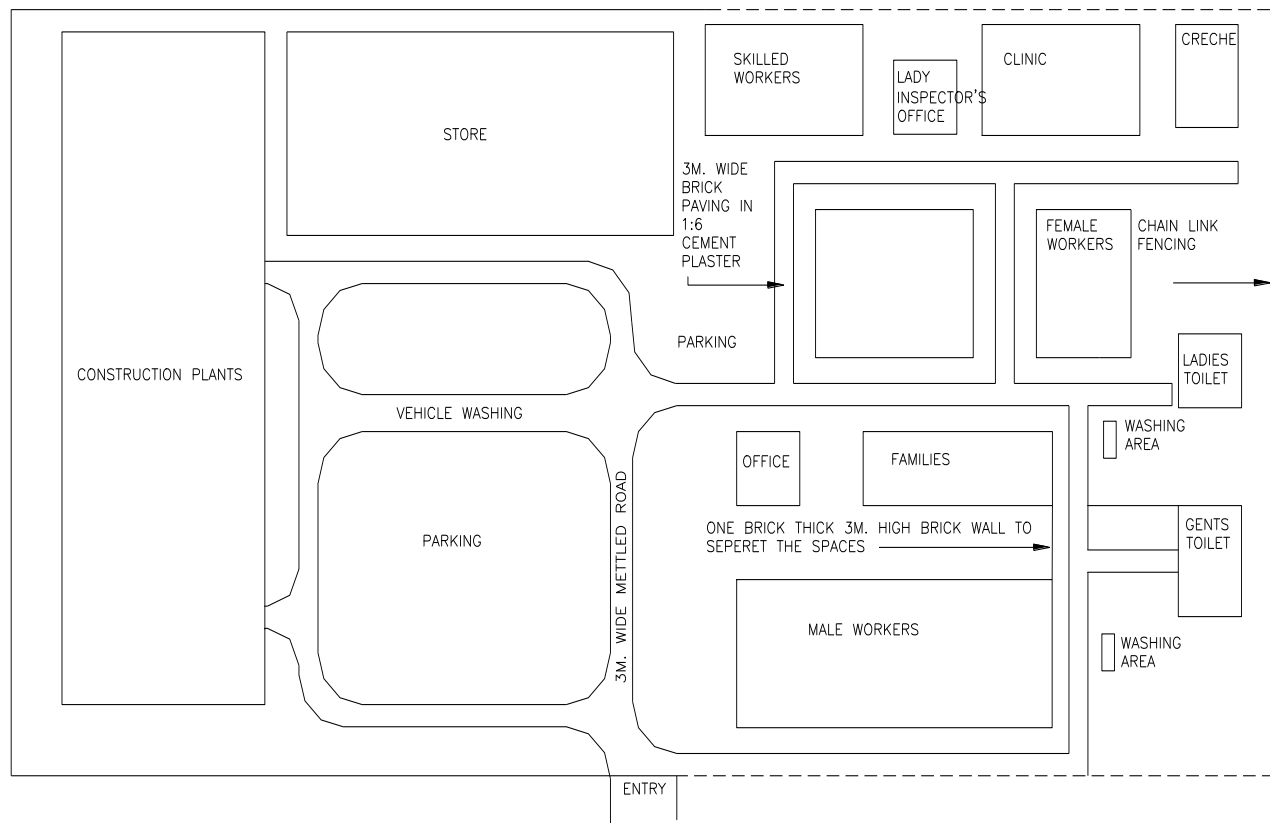


FIGURE A: TYPICAL LAYOUT OF CONSTRUCTION CAMP

Annexure 7.1: MoM of the Public Hearing

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण 04 लेन बकरपुर-मानिकपुर सेक्सन के निर्माण हेतु वैशाली जिला में परियोजना से संबंधित पर्यावरणीय स्वीकृति के वास्ते अधिसूचना सं०-एस.ओ.1533, दिनांक 14 सितम्बर, 2006 के तहत दिनांक 19.08.2023 को पूर्वाह्न 11:00 बजे प्रखंड सभागार, प्रखंड कार्यालय, लालगंज, जिला-वैशाली में आयोजित लोक सुनवाई का वृत्त।।

पर्यावरण प्रभाव मूल्यांकन अधिसूचना सं०-एस.ओ.1533, दिनांक 14 सितम्बर 2006 एवं यथा संशोधित के तहत पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार के द्वारा निर्गत TOR File.No. 10/2/2023-IA.III, dated 21.02.2023 के आलोक में श्री विनोद कुमार सिंह, अपर समाहर्ता, वैशाली (जिला पदाधिकारी, वैशाली के प्रतिनिधि) की अध्यक्षता में बिहार राज्य प्रदूषण नियंत्रण पर्वद्वारा दिनांक 19.08.2023 को पूर्वाह्न 11:00 बजे प्रखंड सभागार, प्रखंड कार्यालय, लालगंज, जिला-वैशाली में लोक-सुनवाई आयोजित की गयी। उपस्थिति पंजी संलग्न (अनुलग्नक-1)

उक्त लोक-सुनवाई की सूचना पर्वद्वारा दैनिक समाचार पत्रों यथा हिन्दुस्तान, एवं दैनिक भास्कर के माध्यम से दिनांक 15.07.2023 को प्रकाशित की गयी थी(प्रतिलिपि संलग्न)। दिनांक 17.08.2023 एवं 18.08.2023 को Miking द्वारा भी लोक-सुनवाई की सूचना स्थानीय आम जनता को दी गयी। इसके अलावे प्रभावित क्षेत्र से मुखिया के माध्यम से लोक-सुनवाई की सूचना स्थानीय आम जनता को दी गयी। लोक-सुनवाई के दौरान श्री आशीष कुमार गुप्ता, क्षेत्रीय पदाधिकारी, बिहार राज्य प्रदूषण नियंत्रण पर्वद्वारा पटना द्वारा लोक-सुनवाई में उपस्थित जन-समुदाय एवं सभी संबंधित पदाधिकारियों का स्वागत करते हुए पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार द्वारा अधिसूचित पर्यावरण प्रभाव मूल्यांकन अधिसूचना सं०-एस.ओ.1533, दिनांक 14 सितम्बर 2006 के तहत इकाईयों के पर्यावरणीय स्वीकृति हेतु लोक-सुनवाई की पृष्ठ-भूमि पर प्रकाश डाला गया।

लोक-सुनवाई कार्यक्रम के अध्यक्ष के अनुमति से जिला भू-अर्जन पदाधिकारी, वैशाली द्वारा पर्यावरण संरक्षण एवं प्रदूषण नियंत्रण के महत्व पर प्रकाश डाला गया। परियोजना के तकनीकी सलाहकार श्री मोईन अहमद ने राष्ट्रीय राजमार्ग के निर्माण एवं विकास कार्य, प्रदूषण नियंत्रण व्यवस्था एवं सोशल कॉरपोरेट रेस्पॉन्सिबिलिटी आदि के संबंध में आम-जनों को विस्तृत रूप से अवगत कराया। इनके द्वारा सूचित किया गया कि प्रस्तावित राजमार्ग वैशाली जिला के दो प्रखंड (लालगंज एवं वैशाली) के 23 गाँव से होकर गुजरती है। वर्तमान परियोजना का दायरा सारण जिले के बाकरपुर गाँव के पास NH-19 के सीतलपुर बाईपास चैनल-0.000 से चैनल-38.813 मानिकपुर गाँव के पास मुजफ्फरपुर जिले में एसएच-74 में विलीन हो जाती है। वैशाली जिला में किमी 18.077 से 35.360 तक गुजरेगी। यह एक हरित क्षेत्र संरक्षण है। आर.ओ.डब्ल्यू मुख्य रूप से 45 मीटर के लिए प्रस्तावित है।

प्रस्तावित सड़क परियोजना का मुख्य उद्देश्य बिहार राज्य में दूरी और यात्रा के समय को कम करना और दूरदराज के क्षेत्रों और प्रमुख शहरों को जोड़ना है। परियोजना इन क्षेत्रों के विकास पर जोर देती है और इन्हें संसाधनों के साथ उपलब्ध कराती है।

इस परियोजना के अनेकों लाभ हैं:-

- बाकरपुर-मानिकपुर खंड NH-139W टर्मिनल का हिस्सा है, यह NH-727 से पहले समाप्त हो जाएगा जो सीधे नेपाल सीमा से जुड़ा हुआ है। यह राजमार्ग देश के अंदर माल ढुलाई के लिए बहुत महत्वपूर्ण होगा।
- NH-139W राज्य की राजधानी पटना और अन्य जिलों को जोड़ता है और हाजीपुर, सारण, वैशाली, सीवान, गोपालगंज, पूर्वी और पश्चिमी चंपारण से होता हुआ नेपाल सीमा की ओर जाता है।
- यह परियोजना फीडर मार्ग है जो पटना (राज्य की राजधानी) और बेतिया (प्रमुख शहर) के बीच सीधी कनेक्टिविटी के लिए बहुत महत्वपूर्ण है जो विभिन्न शहरों से जयप्रकाश हवाई अड्डे (पटना) को जोड़ेगी। यह दो NH (NH-19 और NH-722) के बीच एक लिंक रोड के रूप में कार्य करता है, जिसके कारण पश्चिम बिहार की ओर यातायात प्रभावित होता है। इसके अलावा, सीतलपुर और लालगंज के बीच गंडक नदी पर कोई बड़ा पुल नहीं होने के कारण, इन क्षेत्रों के यात्रियों को लंबी दूरी तय करनी पड़ती है, ज्यादा समय लगता है।
- कुछ महत्वपूर्ण धार्मिक और पर्यटन स्थल (गंडक नदी, हरिहरनाथ मंदिर, सोनपुर मेला, अशोक स्तंभ स्तूप, बुद्ध स्तूप, जैन मंदिर, महात्मा गांधी सेतु और राष्ट्रीय लीची अनुसंधान केंद्र) प्रस्तावित बाकरपुर-मानिकपुर संरक्षण क्षेत्र से जुड़े हैं।

इस परियोजना राजमार्ग की प्रस्तावित लम्बाई (वैशाली जिला में) लगभग 17.283 किलोमीटर है। वैशाली जिला में कुल अधिग्रहित भूमि 80.941 हेक्टेयर, प्रभावित वन भूमि 0.9289 हेक्टेयर है। संरक्षण किसी वन्य जीव अभ्यारण्य, संरक्षित क्षेत्र, राष्ट्रीय उद्यान और इसके पर्यावरण संवेदनशील क्षेत्र से नहीं गुजरता है। परियोजना के दौरान वैशाली जिला में आर.ओ.बी./आर.यू.बी. (01), छोटे पुल (01), पुलिया-(59), अंडरपास (02) का निर्माण प्रस्तावित है।

निर्माण के दौरान कुल पानी की आवश्यकता 27091578.7 किलोलीटर/दिन होगी।

परियोजना लागत रु0 1344.46 करोड़ होगा।

पर्यावरण प्रबंधन योजना (ईएमपी)-परियोजना के निर्माण चरण, कार्यान्वयन और पर्यवेक्षण जिम्मेदारियों के दौरान प्रस्तावित उपायों के कार्यान्वयन को सुनिश्चित करने के लिए परियोजना विशिष्ट पर्यावरण प्रबंधन योजना तैयार की गयी है। पर्यावरण प्रबंधन योजना (ईएमपी) को पर्यावरण और सामाजिक-आर्थिक पहलुओं पर विभिन्न नियामक आवश्यकताओं के ढांचे के भीतर डिजाइन किया गया है, जिसका लक्ष्य निम्नलिखित है:-

1. देशी वनस्पतियों और जीवों को कम से कम प्रभावित हो।
2. वायु, जल मिट्टी और ध्वनि प्रदूषण को रोकना और कम करना।
3. सामाजिक-आर्थिक विकास को बढ़ावा देना।

एक्सप्रेसवे के दोनो तरफ वृक्षारोपण I.R.C.SP21 2009 के अनुसार कराया जाएगा जिसमें मार्ग के दोनो तरफ पंक्तियों में विभिन्न प्रकार के छायादार पौधे लगाए जाएंगे। जिससे वातावरण शुद्ध रहेगा।

शोर का कोई महत्वपूर्ण प्रभाव प्रत्याशित नहीं है। गिट्टी के काग और निर्माण सामग्री के लोडिंग और अनलोडिंग के दौरान नियमित रूप से पानी का छिड़काव किया जाएगा। यातायात के दौरान सभी निर्माण सामग्री को शोरपाल से ढक कर ले जाया जाएगा। सभी निर्माण मशीनरी को नियंत्रण उपकरणों से संचालित किया जाएगा। और किसी गतिविधि से पहले राज्य प्रदूषण नियंत्रण पर्यट से राहगीतों को सूचित किया जाएगा।

निर्माण के दौरान ठोस अपशिष्ट का निपटान ठोस अपशिष्ट प्रबंधन नियम, 2016 में निहित प्रावधानों के अनुसार किया जाएगा।

पर्यावरणीय सलाहकार द्वारा सूचित किया गया कि परियोजना अंतर्गत भूमि का अधिग्रहण सक्षम पदाधिकारी भू-अर्जन द्वारा राष्ट्रीय राजमार्ग अधिनियम, 1958 और भूमि अधिग्रहण में उचित मुआवजा एवं पारदर्शिता, पुनर्वास और स्थानांतरण (आर.एफ.सी.टी.एल.ए.आर.आर.) अधिनियम, 2013 के उचित प्रावधानों और राज्य सरकार के संशोधनों के अनुसार किया जायेगा। राष्ट्रीय राजमार्ग अधिनियम, 1958 के अंतर्गत भूमि अधिग्रहण पर लागू आर.एफ.सी.टी.एल.ए.आर.आर. अधिनियम, 2013 की अनुसूचि 1 अनुसार मुआवजे का निर्धारण, अनुसूचि 2 अनुसार पुनर्वास और स्थानांतरण सहायता का निर्धारण किया जायेगा।

परियोजना प्रस्तुतीकरण के पश्चात् उपस्थित महानुभावों द्वारा दिये गये सुझाव/मंतव्य इस प्रकार है:-

1. श्री रणविजय कुमार शुक्ला, मुखिया, जलालपुर, जिला वैशाली द्वारा सुझाव दिया गया कि कोरमा तटबंध एवं जलालपुर तिरहुत तटबंध लगभग 02 किलोमीटर है। गंडक नदी से एवं तिरहुत नदी से Connectivity होना चाहिए।
2. श्री उपमानंदन राय, बसाढ़, वैशाली द्वारा सुझाव दिया गया कि चौहमुखी महादेव, बसाढ़, जिला-वैशाली में पलाई ओवर नहीं बनाया जाय। सड़क का निर्माण नीचे से ही किया जाय।
3. श्री सिवेश्वर साह, एतवारपुर, वैशाली द्वारा सुझाव दिया गया कि निजामत गांव के शिव मंदिर रोड में एक क्रॉसिंग होना चाहिए।
4. श्री ब्रजकिशोर महतो, विकुलपुर, गोविंदपुर, वैशाली द्वारा सुझाव दिया गया कि निर्माण के दौरान धूल-कण के कारण उत्पन्न वायु प्रदूषण की रोक-थाम के सभी उपाय सुनिश्चित कराया जाना चाहिए।
5. श्री राकेश कुमार, खनजाहाचक, वैशाली द्वारा सुझाव दिया गया कि खनजाहाचक स्कूल के पिछे में पलाई ओवर नहीं बनाया जाय। सड़क का निर्माण नीचे से ही किया जाय।

6. श्री रमेश शुक्ला, एतवारपुर जागीर, इशुपुर, वैशाली द्वारा बताया गया कि सड़क का निर्माण प्रस्तावित है, यह बहुत ही बढ़िया बात है। सड़क क्षेत्र में बाढ़ आना-जाना लगा रहता है। पानी आता है और चला जाता है। इससे खेती में भी अच्छा काम हो जाता है। सड़क का निर्माण कार्य इस तरह से किया जाय कि पानी निकलने का जगह मौजूद रहे, ताकि बाढ़ का पानी जमा न हो।
7. डॉ. प्रभाकर शुक्ला, खनजाहाचक, वैशाली द्वारा सुझाव दिया गया कि लालगंज-खनजाहाचक रोड में पलाई ओवर बनाया जाय एवं इसका कनेक्शन भी पुराने सड़क से दिया जाय। सड़क का निर्माण नीचे से ही किया जाय।

अध्यक्ष महोदय (अपर समाहर्ता, वैशाली) द्वारा बताया गया कि यह परियोजना सारण जिले के बाकरपुर गाँव के पास NH-19 के शीतलपुर बाईपास से मानिकपुर गाँव के पास मुजफ्फरपुर जिले में एसएच-74 में मिलेगी। यह एक ग्रीनफिल्ड प्रोजेक्ट है, जो मुख्य आवादी से हट कर बनाया जाएगा। इस योजना के तहत जमीन अधिग्रहण की आवश्यकता होगी। सरकार जमीन अधिग्रहण करती है एवम मुआवजा देती है। मुआवजा भूमि अधिग्रहण कानून के अनुसार दी जाती है। मुआवजा हेतु अलग से कैंप लगाकर भूमि विवाद को सुलझाया जायेगा। यह परियोजना क्षेत्र के आर्थिक/समाजिक विकास के लिए एवं सामरिक रूप से बहुत ही महत्वपूर्ण है।

अध्यक्ष महोदय द्वारा बताया गया कि आपलोग की बात का ध्यान रखा जाएगा। परियोजना के दौरान स्थानीय जनता को विश्वास में लेने की आवश्यकता है। ऐसा प्रयास होना चाहिए कि प्रदूषण न्यूनतम हो एवं स्थानीय लोगों को रोजगार मिलना चाहिए।

अध्यक्ष महोदय द्वारा लोक-सुनवाई के पश्चात् जनता के प्रति आभार व्यक्त करते हुए इस परियोजना के लिए सक्षम प्राधिकार द्वारा पर्यावरणीय स्वीकृति प्रदान करने हेतु अनुशंसा की गयी तथा लोक-सुनवाई की समाप्ति की घोषणा की गयी।

27-7-13
क्षेत्रीय पदाधिकारी
बि.रा.प्र.नि.पर्यट.पटना

27-7-13
अपर समाहर्ता
वैशाली

लोक सुनवाई का वृत्त

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण 04 लेन बाकरपुर-मानिकपुर सेक्शन के निर्माण हेतु परियोजना से संबंधित पर्यावरणीय स्वीकृति हेतु पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार के अधिसूचना सं०-एस.ओ.1533, दिनांक 14 सितम्बर, 2006 के तहत दिनांक 22.08.2023 को पूर्वाह्न 11:00 बजे प्रखंड सभागार, प्रखंड कार्यालय, दरियापुर, जिला-सारण में मो० मुमताज आलम अपर समाहर्ता, सारण की अध्यक्षता में लोक-सुनवाई की गयी। उपस्थिति पंजी संलग्न (अनुलग्नक-1)।

पर्यावरण प्रभाव मूल्यांकन अधिसूचना सं०-एस.ओ.1533, दिनांक 14 सितम्बर 2006 एवं यथा संशोधित के तहत पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार के द्वारा निर्गत TOR File.No. 10/2/2023-IA.III, dated 21.02.2023 के आलोक में लोक-सुनवाई की गयी। लोक-सुनवाई की सूचना पर्वद्वारा दैनिक समाचार पत्रों यथा दैनिक जागरण एवं प्रभात खबर के माध्यम से दिनांक 15.07.2023 को प्रकाशित की गयी थी (प्रतिलिपि संलग्न)। दिनांक 20.08.2023 एवं 21.08.2023 को Miking द्वारा भी लोक-सुनवाई की सूचना स्थानीय आम जनता को दी गयी। प्रभावित क्षेत्र के मुखिया के माध्यम से भी लोक-सुनवाई की सूचना स्थानीय आम जनता को दी गयी। लोक-सुनवाई के दौरान श्री एस. एन. ठाकुर, क्षेत्रीय पदाधिकारी, बिहार राज्य प्रदूषण नियंत्रण पर्वद्वारा लोक-सुनवाई में उपस्थित जन-समुदाय एवं सभी संबंधित पदाधिकारियों का स्वागत करते हुए पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार द्वारा अधिसूचित पर्यावरण प्रभाव मूल्यांकन अधिसूचना सं०-एस.ओ.1533, दिनांक 14 सितम्बर 2006 के तहत इकाईयों के पर्यावरणीय स्वीकृति हेतु लोक-सुनवाई की पृष्ठ-भूमि पर प्रकाश डाला गया।

लोक-सुनवाई कार्यक्रम के अध्यक्ष द्वारा भी लोक-सुनवाई के उद्देश्य तथा पर्यावरण संरक्षण एवं प्रदूषण नियंत्रण के महत्व पर प्रकाश डाला गया। अध्यक्ष महोदय के अनुमति से परियोजना के तकनीकी सलाहकार श्री मोईद अहमद ने राष्ट्रीय राजमार्ग के निर्माण एवं विकास कार्य, प्रदूषण नियंत्रण व्यवस्था एवं सोशल कॉरपोरेट रेस्पॉन्सिविलिटी आदि के संबंध में आम-जनों को विस्तृत रूप से अवगत कराया। इनके द्वारा सूचित किया गया कि प्रस्तावित राजमार्ग सारण जिला के 22 गाँव से होकर गुजरती है। वर्तमान परियोजना का दायरा सारण जिले के बाकरपुर गाँव के पास NH-19 के सीतलपुर बाईपास चैनेज-0.000 से चैनेज-38.813 मानिकपुर गाँव के पास मुजफ्फरपुर जिले में एसएच-74 में विलीन हो जाती है। सारण जिला में 0.00 से 18.077 किमी तक गुजरेगी। यह एक हरित क्षेत्र संरक्षण है।

प्रस्तावित सड़क परियोजना का मुख्य उद्देश्य बिहार राज्य में दूरी और यात्रा के समय को कम करना और दूरदराज के क्षेत्रों और प्रमुख शहरों को जोड़ना है। यह परियोजना क्षेत्रों के विकास एवं इससे संबंधित संसाधनों को उपलब्ध कराती है।

इस परियोजना के अनेकों लाभ हैं:-

- बाकरपुर-मानिकपुर खंड NH-139W टर्मिनल का हिस्सा है, यह NH-727 से जुड़कर समाप्त हो जाएगा जो सीधे नेपाल सीमा से जुड़ा हुआ है। यह राजमार्ग देश के अंदर माल ढुलाई के लिए बहुत महत्वपूर्ण होगा।

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- NH-139W राज्य की राजधानी पटना और अन्य जिलों को जोड़ता है और हाजीपुर, सारण, वैशाली, सीवान, गोपालगंज, पूर्वी और पश्चिमी चंपारण से होता हुआ नेपाल सीमा की ओर जाता है।
- यह परियोजना फीडर मार्ग है जो पटना (राज्य की राजधानी) और बेतिया (प्रमुख शहर) के बीच सीधी कनेक्टिविटी के लिए बहुत महत्वपूर्ण है जो विभिन्न शहरों से जयप्रकाश हवाई अड्डे (पटना) को जोड़ेगी। यह दो NH (NH-19 और NH-727) के बीच एक लिंक रोड के रूप में कार्य करता है, जिसके कारण पश्चिम बिहार की ओर यातायात प्रभावित होता है। इसके अलावा, सीतलपुर और लालगंज के बीच गंडक नदी पर कोई बड़ा पुल नहीं होने के कारण, इन क्षेत्रों के यात्रियों को लंबी दूरी तय करनी पड़ती है, और ज्यादा समय भी लगता है।
- कुछ महत्वपूर्ण धार्मिक और पर्यटन स्थल (गंडक नदी, हरिहरनाथ मंदिर, सोनपुर मेला, अशोक स्तंभ स्तूप, बुद्ध स्तूप, जैन मंदिर, महात्मा गांधी सेतु और राष्ट्रीय लीची अनुसंधान केंद्र) प्रस्तावित बाकरपुर-मानिकपुर संरेखण क्षेत्र से जुड़े हुए हैं।

यह परियोजना राजमार्ग की प्रस्तावित लम्बाई (सारण जिला में) लगभग 18.077 किलोमीटर है। सारण जिला में कुल अविग्रहित भूमि 99.2290 हेक्टेयर, प्रभावित वन भूमि 0.9545 हेक्टेयर है। संरेखण किसी वन्य जीव अभ्यारण्य, संरक्षित क्षेत्र, राष्ट्रीय उद्यान और इसके पर्यावरण संवेदनशील क्षेत्र से नहीं गुजरता है। परियोजना के दौरान सारण जिला में आर.ओ.बी./आर.यू.बी. (01), छोटे पुल (05), पुलिया-(50), अंडरपास (01) का निर्माण प्रस्तावित है।

परियोजना लागत ₹0 1344.46 करोड़ होगा।

पर्यावरण प्रबंधन योजना (ईएमपी)-परियोजना के निर्माण चरण, कार्यान्वयन और पर्यवेक्षण जिम्मेदारियों के दौरान प्रस्तावित उपायों के कार्यान्वयन को सुनिश्चित करने के लिए परियोजना विशिष्ट पर्यावरण प्रबंधन योजना तैयार की गयी है। पर्यावरण प्रबंधन योजना (ईएमपी) को पर्यावरण और सामाजिक-आर्थिक पहलुओं पर विभिन्न नियामक आवश्यकताओं के ढांचे के भीतर डिजाइन किया गया है, जिसका लक्ष्य निम्नलिखित है:-

1. देशी वनस्पतियों और जीवों को कम से कम प्रभावित हो।
2. वायु, जल मिट्टी और ध्वनि प्रदूषण को रोकना और कम करना।
3. सामाजिक-आर्थिक विकास को बढ़ावा देना।

एक्सप्रेसवे के दोनों तरफ वृक्षारोपण I.R.C.SP21 2009 के अनुसार कराया जाएगा जिसमें मार्ग के दोनों तरफ पंक्तियों में विभिन्न प्रकार के छायादार पौधे लगाए जाएंगे। जिससे वातावरण शुद्ध रहेगा।

शोर का कोई महत्वपूर्ण प्रभाव प्रत्याशित नहीं है। मिट्टी के काम और निर्माण सामग्री के लोडिंग और अनलोडिंग के दौरान नियमित रूप से पानी का छिड़काव किया जाएगा। यातायात के दौरान सभी निर्माण सामग्री को तिरपाल से ढक कर ले जाया जाएगा। सभी निर्माण मशीनरी को नियंत्रण उपकरणों से संचालित किया जाएगा। और किसी गतिविधि से पहले राज्य प्रदूषण नियंत्रण पर्यद से सहमति प्राप्त की जाएगी।

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निर्माण के दौरान ठोस अपशिष्ट का निपटान ठोस अपशिष्ट प्रबंधन नियम, 2016 में निहित प्रावधानों के अनुसार किया जाएगा।

पर्यावरणीय सलाहकार द्वारा सूचित किया गया कि परियोजना अन्तर्गत भूमि का अधिग्रहण सक्षम पदाधिकारी भू-अर्जन द्वारा राष्ट्रीय राजमार्ग अधिनियम, 1956 और भूमि अधिग्रहण में उचित मुआवजा एवं पारदर्शिता, पुनर्वास और स्थानांतरण (आर.एफ.सी.टी.एल.ए.आर.आर.) अधिनियम, 2013 के उचित प्रावधानों और राज्य सरकार के संशोधनों के अनुसार किया जायेगा। राष्ट्रीय राजमार्ग अधिनियम, 1956 के अंतर्गत भूमि अधिग्रहण पर लागू आर.एफ.सी.टी.एल.ए.आर.आर. अधिनियम, 2013 की अनुसूचि 1 अनुसार मुआवजे का निर्धारण, अनुसूचि 2 अनुसार पुनर्वास और स्थानांतरण सहायता का निर्धारण किया जायेगा।

परियोजना प्रस्तुतीकरण के पश्चात् उपस्थित महानुभावों द्वारा दिये गये सुझाव/मंतव्य इस प्रकार है:-

क्रमांक	प्रतिक्रिया/सुझाव	प्रस्तावक के जवाब
1.	श्री योगेन्द्र प्रसाद मगरपाल- इनके द्वारा सूचित किया गया कि जमीन मालिक को अभी तक नोटिस नहीं मिला है। सबसे पहले जमीन का डी-मार्केशन होना चाहिए। सलाहकार द्वारा प्रदूषण नियंत्रण के लिए जो भी व्यवस्था बतायी गयी है, उसका अनुपालन होना चाहिए।	सलाहकार द्वारा अवगत कराया गया कि जमीन का डि-मार्केशन हो चुका है। जिला प्रशासन द्वारा प्रभावित सभी जमीन मालिकों को विधिवत नोटिस देने के बाद ही जमीन अधिग्रहण किया जायेगा। साथ ही इनके द्वारा आश्वासन दिया गया कि प्रदूषण नियंत्रण के लिए बताये गये उपायों को संबंधित विभाग द्वारा अनुपालन कराया जायेगा।
2.	श्री कौशल किशोर सिंह पैक्स अध्यक्ष दरिहारा, श्री दसई सिंह बाकरपुर, श्री रामलखन सिंह बाकरपुर, श्री बिरेन्द्र सिंह बाकरपुर, श्री रामायण कुमार सरैया- इनके द्वारा अवगत कराया गया कि दरिहारा पंचायत में एक 10+2 स्तरीय एक विधालय है, परन्तु इनके द्वारा नक्शा में दो भाग में बाँट दिया गया है। विधालय प्रांगण के बीच से सड़क निकाला गया है जिसके कारण विधालय का अस्तित्व बर्बाद हो रहा है।	इस संबंध में अपर समाहर्ता द्वारा उपस्थित महानुभावों को अवगत कराया गया कि आपकी भावनाओं को अंकित कर अग्रसारित की जायेगी साथ ही अनुरोध किया जायेगा कि वर्तमान सड़क एलाइनमेंट के संबंध में पुनः विचार किया जाये जिससे विधालय का अस्तित्व सुरक्षित रहें। इस संबंध में सलाहकार द्वारा अवगत कराया गया कि लोगों को एवं विद्यार्थी को कोई असुविधा नहीं हो, इसका ख्याल करते हुए विशेष परिस्थिति में अंडर पास का प्रावधान किया जायेगा। परियोजना लोगों की सुविधा, लाभ एवं भावनाओं का ख्याल रखते हुए ही बनायी जाती है।
3.	श्री कामख्या नारायण भटपुरा, श्रीमति राधिका देवी नयका टोला मानपुरा, श्री प्रेम कुमार साह	इस संबंध में सलाहकार द्वारा लोगों को अवगत कराया गया कि जिला प्रशासन द्वारा वर्तमान सरकारी मूल्य

	बाकरपुर- मेरा जमीन रेलवे भी गया है और फिर सड़क में भी जा रहा है, जिसके कारण मेरे पास खेती करने के लिए जमीन कम पड़ रहा है।	के लगभग चार गुणा राशी प्रभावित लोगों को भूगतान किया जाता है, ताकि वे अपनी इच्छा अनुसार अन्य स्थल पर मकान या जमीन खरीद सकें।
4.	श्री भूषण राय मानपुरा दरियापुर- जमीन का भूगतान किस दर से किया जायेगा। हमलोग चार भाई हैं। भूगतान किसके नाम से किया जायेगा।	सलाहकार द्वारा अवगत कराया गया कि सरकारी दरतावेज में जिस भाई का नाम अंकित होगा उसी के नाम से भूगतान की जायेगी। वे आपस में समाजस्य बैठकर भूगतान की गयी राशी का आपस में बटवारा करेंगे।
5.	श्री अमरनाथ राय कोन्हा- मेरा जमीन टोपो लैंड में पड़ता है। जमीन से संबंधित कोई कागजात मेरे पास नहीं है। इसका क्या उपाय किया जायेगा।	अध्यक्ष महोदय द्वारा अवगत कराया गया कि जमीन से संबंधित भूगतान की कार्रवाई भू-अर्जन पदाधिकारी द्वारा की जाती है। असंतुष्ट होने पर अपनी बात/शिकायत जिला के वरीय पदाधिकारी को दे सकते हैं।

अध्यक्ष महोदय द्वारा बताया गया कि यह परियोजना सारण जिले के बाकरपुर गाँव के पास NH-19 के सीतलपुर बाईपास से मानिकपुर गांव के पास मुजफ्फरपुर जिले में एसएच-74 में मिलेगी। यह एक ग्रीनफिल्ड प्रोजेक्ट है, जो मुख्य आवादी से हट कर बनाया जाएगा। इस योजना के तहत जमीन अधिग्रहण की आवश्यकता होगी। सरकार जमीन अधिग्रहण करती है एवं मुआवजा देती है। मुआवजा भूमि अधिग्रहण कानून के अनुसार दी जाती है। मुआवजा हेतु अलग से कैंप लगाकर भूमि विवाद को सुलझाया जायेगा। यह परियोजना क्षेत्र के आर्थिक/समाजिक विकास के लिए एवं सामरिक रूप से बहुत ही महत्वपूर्ण है। साथ ही बताया गया कि आपलोग की बात का ध्यान रखा जाएगा एवं प्रदूषण नियंत्रण हेतु बताये गये उपायों को सुनिश्चित कराई जायेगी।

अध्यक्ष महोदय द्वारा लोक-सुनवाई के पश्चात् जनता के प्रति आभार व्यक्त करते हुए इस परियोजना के लिए सक्षम प्राधिकार द्वारा पर्यावरणीय स्वीकृति प्रदान करने हेतु अनुशंसा की गयी तथा लोक-सुनवाई की समाप्ति की घोषणा की गयी।


18/9/2023
क्षेत्रीय पदाधिकारी
वि.रा.प्र.नि.पर्वद, मुजफ्फरपुर


अपर समाहर्ता
सारण

लोक सुनवाई का वृत्त

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण 04 लेन बाकरपुर-मानिकपुर सेक्शन के निर्माण हेतु परियोजना से संबंधित पर्यावरणीय स्वीकृति हेतु पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार के अधिसूचना सं०-एस.ओ.1533, दिनांक 14 सितम्बर, 2006 के तहत दिनांक 23.08.2023 को पूर्वाह्न 11:00 बजे प्रखंड समीक्षा, प्रखंड कार्यालय, सरैया, जिला-मुजफ्फरपुर में अपर समाहर्ता महोदय, मुजफ्फरपुर की अध्यक्षता में लोक-सुनवाई की गयी। उपस्थिति पंजी संलग्न (अनुलग्नक-1)।

पर्यावरण प्रभाव मूल्यांकन अधिसूचना सं०-एस.ओ.1533, दिनांक 14 सितम्बर 2006 एवं यथा संशोधित के तहत पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार के द्वारा निर्गत TOR File.No. 10/2/2023-IA.III, dated 21.02.2023 के आलोक में लोक-सुनवाई की गयी। लोक-सुनवाई की सूचना पर्वद्वारा दैनिक समाचार पत्रों यथा दैनिक जागरण एवं हिंदुस्तान के माध्यम से दिनांक 15.07.2023 को प्रकाशित की गयी थी (प्रतिलिपि संलग्न)। दिनांक 22.08.2023 को Miking द्वारा भी लोक-सुनवाई की सूचना स्थानीय आम जनता को दी गयी। प्रभावित क्षेत्र के मुखिया के माध्यम से भी लोक-सुनवाई की सूचना स्थानीय आम जनता को दी गयी। लोक-सुनवाई के दौरान श्री एस. एन. ठाकुर, क्षेत्रीय पदाधिकारी, बिहार राज्य प्रदूषण नियंत्रण पर्वद्वारा मुजफ्फरपुर द्वारा लोक-सुनवाई में उपस्थित जन-समुदाय एवं सभी संबंधित पदाधिकारियों का स्वागत करते हुए पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार द्वारा अधिसूचित पर्यावरण प्रभाव मूल्यांकन अधिसूचना सं०-एस.ओ.1533, दिनांक 14 सितम्बर 2006 के तहत इकाईयों के पर्यावरणीय स्वीकृति हेतु लोक-सुनवाई की पृष्ठ-भूमि पर प्रकाश डाला गया।

लोक-सुनवाई कार्यक्रम के अध्यक्ष द्वारा भी लोक-सुनवाई के उद्देश्य तथा पर्यावरण संरक्षण एवं प्रदूषण नियंत्रण के महत्व पर प्रकाश डाला गया। अध्यक्ष महोदय के अनुमति से परियोजना के तकनीकी सलाहकार मोईद अहमद ने राष्ट्रीय राजमार्ग के निर्माण एवं विकास कार्य, प्रदूषण नियंत्रण व्यवस्था एवं सोशल कॉरपोरेट रेस्पॉन्सिविलिटी आदि के संबंध में आम-जनों को विस्तृत रूप से अवगत कराया। इनके द्वारा सूचित किया गया कि प्रस्तावित राजमार्ग मुजफ्फरपुर जिले के 06 गाँव से होकर गुजरती है। वर्तमान परियोजना का दायरा मुजफ्फरपुर जिले के अबूचक गाँव चैनेज-0.000 से चैनेज-38.813 मानिकपुर गाँव के पास मुजफ्फरपुर जिले में एसएच-74 में विलीन हो जाती है। मुजफ्फरपुर जिले में 35.360 से 38.813 किमी तक गुजरेगी। यह एक हरित क्षेत्र संरक्षण है।

प्रस्तावित सड़क परियोजना का मुख्य उद्देश्य बिहार राज्य में दूरी और यात्रा के समय को कम करना और दूरदराज के क्षेत्रों और प्रमुख शहरों को जोड़ना है। यह परियोजना क्षेत्रों के विकास एवं इससे संबंधित संसाधनों को उपलब्ध कराती है।

इस परियोजना के अनेकों लाभ हैं:-

- बाकरपुर-मानिकपुर खंड NH-139W टर्मिनल का हिस्सा है, यह NH-727 से जुड़कर समाप्त हो जाएगा जो सीधे नेपाल सीमा से जुड़ा हुआ है। यह राजमार्ग देश के अंदर माल ढुलाई के लिए बहुत महत्वपूर्ण होगा।

- NH-139W राज्य की राजधानी पटना और अन्य जिलों को जोड़ता है और हाजीपुर, सारण, वैशाली, सीवान, गोपालगंज, पूर्वी और पश्चिमी चंपारण से होता हुआ नेपाल सीमा की ओर जाता है।
- यह परियोजना फीडर मार्ग है जो पटना (राज्य की राजधानी) और वेतिया (प्रमुख शहर) के बीच सीधी कनेक्टिविटी के लिए बहुत महत्वपूर्ण है जो विभिन्न शहरों से जयप्रकाश हवाई अड्डे (पटना) को जोड़ेगी। यह दो NH (NH-19 और NH-727) के बीच एक लिंक रोड के रूप में कार्य करता है, जिसके कारण पश्चिम बिहार की ओर यातायात प्रभावित होता है। इसके अलावा, सीतलपुर और लालगंज के बीच गंडक नदी पर कोई बड़ा पुल नहीं होने के कारण, इन क्षेत्रों के यात्रियों को लंबी दूरी तय करनी पड़ती है, और ज्यादा समय भी लगता है।
- कुछ महत्वपूर्ण धार्मिक और पर्यटन स्थल (गंडक नदी, हरिहरनाथ मंदिर, सोनपुर मेला, अशोक स्तंभ स्तूप, बुद्ध स्तूप, जैन मंदिर, महात्मा गांधी सेतु और राष्ट्रीय लीची अनुसंधान केंद्र) प्रस्तावित बाकरपुर-मानिकपुर संरक्षण क्षेत्र से जुड़े हुए हैं।

यह परियोजना राजमार्ग की प्रस्तावित लम्बाई (मुजफ्फरपुर जिला में) लगभग 3.453 किलोमीटर है। मुजफ्फरपुर जिला में कुल अधिग्रहित भूमि 15.6396 हेक्टेयर, प्रभावित वन भूमि 2.2246 हेक्टेयर है। संरक्षण किसी वन्य जीव अभ्यारण्य, संरक्षित क्षेत्र, राष्ट्रीय उद्यान और इसके पर्यावरण संवेदनशील क्षेत्र से नहीं गुजरता है। परियोजना के दौरान मुजफ्फरपुर जिला में आर.ओ.बी./आर.यू.बी. (0), छोटे पुल (0), पुलिया-(08), अंडरपास (0) का निर्माण प्रस्तावित है।

परियोजना लागत ₹ 1344.46 करोड़ होगा।

पर्यावरण प्रबंधन योजना (ईएमपी)-परियोजना के निर्माण चरण, कार्यान्वयन और पर्यवेक्षण जिम्मेदारियों के दौरान प्रस्तावित उपायों के कार्यान्वयन को सुनिश्चित करने के लिए परियोजना विशिष्ट पर्यावरण प्रबंधन योजना तैयार की गयी है। पर्यावरण प्रबंधन योजना (ईएमपी) को पर्यावरण और सामाजिक-आर्थिक पहलुओं पर विभिन्न नियामक आवश्यकताओं के ढांचे के भीतर डिजाइन किया गया है, जिसका लक्ष्य निम्नलिखित है:-

1. देशी वनस्पतियों और जीवों को कम से कम प्रभावित हो।
2. वायु, जल मिट्टी और ध्वनि प्रदूषण को रोकना और कम करना।
3. सामाजिक-आर्थिक विकास को बढ़ावा देना।

एक्सप्रेसवे के दोनो तरफ वृक्षारोपण I.R.C.SP21 2009 के अनुसार कराया जाएगा जिसमें मार्ग के दोनो तरफ पंक्तियों में विभिन्न प्रकार के छायादार पौधे लगाए जाएंगे। जिससे वातावरण शुद्ध रहेगा।

शोर का कोई महत्वपूर्ण प्रभाव प्रत्याशित नहीं है। मिट्टी के काम और निर्माण सामग्री के लोडिंग और अनलोडिंग के दौरान नियमित रूप से पानी का छिड़काव किया जाएगा। यातायात के दौरान सभी निर्माण सामग्री को तिरपाल से ढक कर ले जाया जाएगा। सभी निर्माण मशीनरी को नियंत्रण उपकरणों से संचालित किया जाएगा। और किसी गतिविधि से पहले राज्य प्रदूषण नियंत्रण पर्यद से सहमति प्राप्त की जाएगी।

निर्माण के दौरान ठोस अपशिष्ट का निपटान ठोस अपशिष्ट प्रबंधन नियम, 2016 में निहित प्रावधानों के अनुसार किया जाएगा।

पर्यावरणीय सलाहकार द्वारा सूचित किया गया कि परियोजना अंतर्गत भूमि का अधिग्रहण सक्षम पदाधिकारी भू-अर्जन द्वारा राष्ट्रीय राजमार्ग अधिनियम, 1956 और भूमि अधिग्रहण में उचित मुआवजा एवं पारदर्शिता, पुनर्वास और स्थानांतरण (आर.एफ.सी.टी.एल.ए.आर.आर.) अधिनियम, 2013 के उचित प्रावधानों और राज्य सरकार के संशोधनों के अनुसार किया जायेगा। राष्ट्रीय राजमार्ग अधिनियम, 1956 के अंतर्गत भूमि अधिग्रहण पर लागू आर.एफ.सी.टी.एल.ए.आर.आर. अधिनियम, 2013 की अनुसूचि 1 अनुसार मुआवजे का निर्धारण, अनुसूचि 2 अनुसार पुनर्वास और स्थानांतरण सहायता का निर्धारण किया जायेगा।

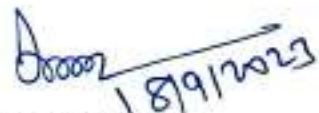
परियोजना प्रस्तुतीकरण के पश्चात् उपस्थित महानुभावों द्वारा दिये गये सुझाव/मंतव्य इस प्रकार है:-

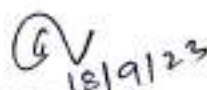
क्रमांक	प्रतिक्रिया/सुझाव	प्रस्तावक के जवाब
1.	श्री विजय प्रसाद अबूचक, श्रीमति माया देवी अबूचक- मेरा जमीन बार-बार सरकार द्वारा ली जा रही है। सड़क बनने से इसके पास का भी जमीन बर्बाद होगी। यह क्षेत्र वायु प्रदूषण एवं ध्वनि से प्रभावित होगी। तेज गति से वाहनों के चलने के कारण दुर्घटनाएँ होगी। इनके द्वारा अंडर पास नहीं दी जाती है। पुरानी सड़क को ही क्यों नहीं चौड़ा किया जा रहा है। भूमिहीन होने वाले बच्चे को नौकरी भी नहीं है।	अध्यक्ष महोदय के अनुमति से प्रखण्ड विकास पदाधिकारी सरैया द्वारा श्री विजय प्रसाद एवं अन्य द्वारा पूछे गये प्रश्नों का उत्तर विस्तृत रूप में देते हुए उपस्थित अन्य लोगों को भी समझाया गया कि जब विकास होता है, तो उसमें कुछ लोगों को त्याग भी करना पड़ता है। किसी भी दिशा से सड़क गुजारा जाये, वहाँ भी किसी व्यक्ति का जमीन और मकान एलाईमेंट में अवश्य पड़ेगा। परियोजना किसी व्यक्ति विशेष के साथ पक्षपात करते हुए तैयार नहीं किया जाता है। दुर्घटनाओं से बचने के लिए राजमार्ग द्वारा जगह-जगह पर साईन बोर्ड एवं आवश्यक दिशा निर्देश सूचक चिन्ह दिये जाते हैं, जिसका अनुपालन नहीं करने पर ही दुर्घटना सम्भव है।
2.	श्री गुड्डू कुमार अबूचक, श्री जय प्रकाश गुप्ता अबूचक, श्री पंकज कुमार अबूचक, श्री राजेन्द्र राय अबूचक- वर्तमान परियोजना के कारण कुछ किसान भूमिहीन हो जायेंगे। इस क्षेत्र में सर्वे नहीं हुआ है, जिसके कारण दी जा रही सूचना गलत है। जमीन का सही कीमत तय की जायें। वर्तमान	इस संबंध में परियोजना के सलाहकार एवं राष्ट्रीय राजमार्ग परियोजना निदेशक द्वारा सूचना दी गयी की क्षेत्र में सर्वे का कार्य किया गया है एवं तैयार की गयी डाटा वह कार्यालय में बैठकर नहीं किया गया है। जमीन का प्रकार एवं उसका मूल्य जिला के भू-अर्जन पदाधिकारी द्वारा सरकार द्वारा निर्धारित नियमों

	जमीन आवारीय होना चाहिए जबकि भीड़ दर्शाया गया है।	के तहत ही किया जाता है। अरांतुष्ट व्यक्ति अपनी समस्या को लेकर जिला के वरीय पदाधिकारी के पास भी प्रतिवेदन दे सकते हैं।
3.	श्री हरेन्द्र भगत विरपुर एवं श्री अशोक राय वैशाली- इनके द्वारा अवगत कराया गया कि मात्र एक ब्लू होटल को बचाने के लिए सड़क का एलाईनमेन्ट पूरब की तरफ बढ़ा दिया गया है।	इस संकट में परियोजना निदेशक द्वारा उपस्थित पदाधिकारी एवं जन समुदाय को अवगत कराया गया कि कोई भी परियोजना एक व्यक्ति विशेष के स्वार्थ पूर्ति के लिए करोड़ों रुपये का अनावश्यक खर्च का बोझ सरकार को नहीं देगी। इससे संबंधित निर्णय उच्च पदाधिकारियों के समूह द्वारा लिया जाता है। उक्त होटल का एलाईनमेन्ट से बचने का मुख्य कारण यह भी है कि सड़क की चौड़ाई 60 मीटर के जगह 45 मीटर की गयी है।

अध्यक्ष महोदय द्वारा बताया गया कि यह परियोजना मुजफ्फरपुर जिले के अबूचक गाँव से मानिकपुर गाँव के पास मुजफ्फरपुर जिले में एसएच-74 में मिलेगी। यह एक ग्रीनफिल्ड प्रोजेक्ट है, जो मुख्य आवादी से हट कर बनाया जाएगा। इस योजना के तहत जमीन अधिग्रहण की आवश्यकता होगी। सरकार जमीन अधिग्रहण करती है एवं मुआवजा देती है। मुआवजा भूमि अधिग्रहण कानून के अनुसार दी जाती है। मुआवजा हेतु अलग से कैंप लगाकर भूमि विवाद को सुलझाया जायेगा। यह परियोजना क्षेत्र के आर्थिक/समाजिक विकास के लिए एवं सामरिक रूप से बहुत ही महत्वपूर्ण है। साथ ही बताया गया कि आपलोग की बात का ध्यान रखा जाएगा एवं प्रदूषण नियंत्रण हेतु बताये गये उपायों को सुनिश्चित कराई जायेगी।

अध्यक्ष महोदय द्वारा लोक-सुनवाई के पश्चात् जनता के प्रति आभार व्यक्त करते हुए इस परियोजना के लिए सक्षम प्राधिकार द्वारा पर्यावरणीय स्वीकृति प्रदान करने हेतु अनुशंसा की गयी तथा लोक-सुनवाई की समाप्ति की घोषणा की गयी।


 क्षेत्रीय पदाधिकारी
 वि.रा.प्र.नि.पर्वद, मुजफ्फरपुर


 अपर समाहर्ता
 मुजफ्फरपुर

Annexure 8.1: Format for Reporting of Road Kill

Annexure 8.1: Format for Reporting of Road Kill

Date				Time	
Chainage (Km)-		Village-		Distance from Road (m)	
Local/ Common Name of Species		Scientific Name (if known)		Sighting / Kill	
Photographs of Road Kill					
Top View		View from LHS		View from RHS	
Signature (Contractor)		Signature (Concessionaire)		Signature (AE/MC)	

Annexure 9.1: Environmental Management Plan

Annexure 9.1: Environmental Management Plan

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
A. Pre-construction and Design Stage									
1. Alignment									
1.1 Pavement damage and inadequate drainage provisions in habitation areas	• Pavement construction in habitation areas considering alignment level and drainage • Raise road level above the nearby areas with provision of adequate side drains to evacuate the rain water and domestic discharges (drained by inhabitants occasionally) to prevent damage to road and rain water entry to habitation area as per IRC SP:42-1994 and 50-1999. • Adequate Cross drainage structures to be provided as per requirements. • Unlined drains are proposed along the road in either side • Line drains are proposed at some of the locations.	Design requirement	All habitation areas, throughout the alignment	Design of both cross & side drains	Design of both side drain in urban area should be incorporated in design	Review of detail design documents & drawings	Included in construction cost	Design Consultant	NHAI / AE
1.2 Safety along the proposed alignment	• Provision of road signage and pavement marking as per IRC:67-2012. • Provision of speed regulator in habitat / sensitive areas to regulate vehicle speed • Provision of signage and other safety measure for pedestrian crossing near habitat areas, school, hospital, religious places • Provision of footpath cum drain in habitation areas • Compliance with norms specified in IRC codes for major district road for curvature	Design requirement	Accident prone areas, habitat areas and bridge area, domesticated animals Movement area	No. of accident & Vehicle collision, Accidental Kill of domesticated animals	Provision of cautionary sign board, Speed regulator and signage in habitat and sensitive areas	Field observation, interview of locals	Included in construction cost	Design Consultant	NHAI / AE
2. Natural Hazards									
2.1 Protection for damage from Earthquake	• Design considering relevant IRC specifications No 6-2010 for earthquakes in bridges		Throughout the stretch	Incorporation of IRC guidelines for earthquake in bridge design	Incorporation of IRC guidelines	Review of bridge design	Project preparation Cost	Design Consultant	NHAI / AE
2.2 Protection of Road embankment in Flood prone / water logged	• Improvement in existing culverts to maintain or increase their carrying capacity. • Provision of adequate drainage and cross drainage structures	IRC:34 Recommendations for road construction	All the existing culverts / bridges	Design of both cross & side drains	Design after consideration of flood hazard	Review of design	Included in construction cost	Design Consultant	NHAI / AE

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
areas		in waterlogged area and IRC: 75 and MORT&H guidelines for Design of High Embankment							
3. Shifting of utility structures									
3.1 Disruption of utility services to local community	- Electric poles, transformers, Hand Pump, HT Line and OFC poles are likely to be shifted before start of construction. Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services - Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any	Project requirement	Throughout the corridor	Utility shifting plan Complaints from local people Status of local utility services	Necessary approval from regulatory body with proper safety provisions	Interaction with concerned utility authorities and local public	Included in construction	Concessionaire/Contractor	NHAI / AE
B. Construction Stage									
1. Air Quality									
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	- Transport of construction materials in covered vehicles. - Storage areas to be located downwind of the habitation area - Water spraying on earthworks, unpaved haulage roads and other dust prone area. - Provision of PPEs to workers.	MORT&H Specifications for Road and Bridge works (Clause No 111) Air Act, 1981 and Central Motor and Vehicle Act, 1988	Throughout project corridor	Particulate matter concentration measurements, Dust pollution or complaint of locals	Zero complaint from locals Level of pollution should not exceed the NAAQ standards	Standards CPCB methods Observations Public consultation	Included in project cost	Concessionaire/Contractor	NHAI / AE
1.2 Emission of air pollutants (SO ₂ , NO _x , CO etc.) from vehicles due to traffic congestion and use of	- Regular maintenance of machinery and equipment. - Batching plant, Asphalt mixing plants and crushers at downwind (1 km) direction from the nearest settlement. - Only crushers licensed by the PCB shall be used - Use of low Sulphur diesel as fuel in DG sets. - Ambient air quality monitoring	The Air Act, 1981 and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	Monitoring of ambient air quality & checking PUC certificates	Zero complaint from locals Level of pollution should not exceed the NAAQ	Standards CPCB methods	Included in project cost	Concessionaire/Contractor	NHAI / AE

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
equipment and machinery	Use of PUC certified vehicles				standards				
2. Noise									
2.1 Noise from construction vehicle, equipment and machinery.	- All equipment to be timely serviced and properly maintained. - Construction equipment and machinery to be fitted with silencers and maintained properly. - Only IS approved equipment shall be used for construction activities. - Timing of noisy construction activities shall be done during night time and weekends near schools and selected suitable times near temples when there are no visitors, - Time regulation near residential, built up and construction shall be restricted to daylight hours. - Initiation of multi layered plantation in open areas (if any) - Honking restrictions near sensitive areas - PPEs to workers - Noise monitoring as per EMP - Provision of Noise Barrier at sensitive receptors likely to experience high noise.	Noise Pollution (Regulation and Control) Rules, 2000	Throughout project section especially at construction sites, residential and identified sensitive locations	Noise levels Measurements Complaints from local people	Zero Complaints from locals Leq should not exceed as per prescribed limit	As per rule, 2000 Consultation with local people	Included in Project Cost	Concessionaire/ Contractor	NHAI / AE
3. Land and Soil									
3.1 Land use Change and Loss of productive / top soil	Non-agricultural areas to be used as borrow areas to the extent possible (if required).	Project requirement	Throughout the project section and borrow areas	Borrow pit locations Top soil storage area	Productive land should be avoided for borrowing / construction purpose	Review borrow area plan, site visits	Included in construction cost	Concessionaire/ Contractor	NHAI / AE
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	- Care should be taken that the slope gradient shall not be greater than 2:1. - The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	IRC:56 - 1974 recommended practice for treatment of embankment slopes for erosion control	Throughout the entire project road	Occurrence of slope failure or erosion issues	Necessary provisions as per column 2 should be implemented	Review of design documents and site observation	Included in Construction cost	Design consultant and Contractor/Concessionaire	NHAI / AE
3.3 Borrow area	Non-productive, barren lands, upland shall be	IRC	Borrow sites	Existence of	Productive	Review of	Included in	Design consultant	NHAI/ AE

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
management	- used for borrowing earth with the necessary permissions/consents. - Depths of borrow pits to be regulated and sides not steeper than 25%. - Topsoil to be stockpiled and protected for use at the rehabilitation stage. - Transportation of earth materials through covered vehicles. - Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with fishery department. - Garland drain all along the Borrow area - Detailed borrow area management plan is given as Annexure 7.3.	specifications No 10-1961 on borrow areas (Environmental Protection Act and Rules, 1986; Water Act, Air Act)	location	borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Incidents of accidents. Complaints from local people.	land should be avoided for borrowing purpose Borrow area should be selected as per MoRTH and IRC-10, 1961 specifications	design documents and site observation	Construction cost	and Contractor/Concessionaire	
3.4 Quarry Operations	- Aggregates will be sourced from existing licensed quarries - In case Contractor/Concessionaire decides in opening new stone quarries he shall follow the stipulated GoI norms	Clause No 111.3 MORT&H Specifications for Road and Bridge works Guidelines	Quarry area locations	Existence of licenses for all quarry areas from which materials are being sourced	Only licensed quarry should be used	Review of design documents, contractor documents and site observation	Included in Construction cost	Contractor/Concessionaire	NHAI/ AE
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	- Construction vehicles, machinery, and equipment to be stationed in the designated RoW to avoid compaction. - Approach roads / haulage roads shall be designed along barren and hard soil area to reduce the compaction. - Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. - Land taken for construction camp and other temporary facility shall be restored to its original conditions.	Design requirement	Parking areas, Haulage roads and construction yards.	Location of approach and haulage roads Presence of destroyed / compacted agricultural land or land which has not be restored to its original condition	Ensure 3times water sprinkling on all haul roads	Site observation	Included in construction cost	Contractor/Concessionaire	NHAI/ AE
3.6 Contamination of soil due to leakage / spillage of oil, bituminous and	- Construction vehicles and equipment will be maintained and refueled in such a fashion that oil / diesel spillage does not contaminate the soil. - Fuel storage and refueling sites to be kept away from drainage channels. - All excavated materials from roadway, shoulders,	Design requirement	Fueling station, construction sites, and construction camps and	Quality of soil near storage area Presence of spilled oil or bitumen in	Should ensure proper storage to achieve zero contamination	Site observation	Included in construction cost.	Contractor/Concessionaire	NHAI/ AE

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
non-bituminous debris generated from demolition and road construction	- verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. - To avoid soil contamination 2nos of Oil-Interceptors shall be provided at wash down and refueling areas. - Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF&CC/SPCB authorized vendors only - Unusable and non-bituminous debris materials should be suitably disposed of in an environmentally acceptable manner at pre-designated disposal locations as directed by AE, with approval of the concerned authority. - The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MoRTH guidelines should be followed		disposal location.	project area					
4. Water Resources									
4.1 Sourcing of water during Construction	- Requisite permission shall be obtained for abstraction of groundwater from Central Groundwater Authority and Surface Water from Irrigation Department and/or CWC or other concerned authorities. Extraction of Groundwater should be avoided since the project area is located in water scarce zone - Arrangements shall be made by contractor/concessionaire that the water availability and supply to nearby communities remain unaffected.	-	Throughout the project construction	Approval from competent authority Complaints from local people on water availability	No complaints from downstream users	Checking of documentation Discussion with local people	Included in construction cost	Contractor/Concessionaire	NHAI/ AE
4.2 Disposal of waste water	- Waste water will be disposed at suitable location. - No-runoff water will be discharged to existing pond being used for domestic and recreational purposes.	Environment Protection Act, 1986 and Water Act, 1974	Throughout the Project construction	Existence of proper drainage system for disposal of waste water	Reutilization for water sprinkling and horticulture purpose	Standards Site observation and review of documents	Included in construction cost	Contractor/Concessionaire	NHAI/ AE
4.3 Alteration in surface water hydrology due to embankment	Existing drainage system to be maintained and further enhanced.	Design requirement, Clause No 501.8.6. MORT&H Specifications	Near all drainage channels, river, cross drainages structures,	Design of road side drains	No alteration	Review of design documents Site observation	Included in construction cost	Contractor/Concessionaire	NHAI/ AE

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
4.4 Siltation in water bodies due to construction activities / earthwork	- Provision of 2000m of Silt fencing shall be made for water bodies - Earthworks and stone works to be prevented from impeding natural flow of streams and water canals or existing drainage system. - Periodic monitoring of water quality as per Environmental Monitoring Plan.	MoRT&H Specifications for Road and Bridge works and worldwide best practices	etc. Near all water bodies, river embankment slopes.	Siltation of rivers, streams, ponds and other water bodies in project area	Ensure provision of silt fencing near water bodies to ensure zero siltation due to construction activities	Field observation	Included in construction cost	Contractor/Concessionaire	NHAI/ AE
4.5 Deterioration in Surface water quality due to leakage from vehicles and equipment and waste from construction camps.	- No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants. 2 Nos of Oil-Interceptors shall be provided at wash down and refueling areas. - All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. - Construction camp to be sited away from water bodies. - Wastes must be collected, stored and taken to approve disposal site only. - Water quality shall be monitored periodically	The Water Act, 1974 and amendments thereof.	Water bodies, refueling stations, construction camps.	Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area	Construction camp should be 500 m away from nearest water body Zero Contamination	Conduction of water quality tests as per the monitoring plan Field observation	Included in project cost	Contractor/Concessionaire	NHAI/ AE
4.6 Sewage discharge from the construction camp	Septic tank with soak pit will be provided in construction camp	The Water Act, 1974 and amendments thereof.	Construction Camp	Discharge practice of sewage	Provision of septic tank with soak pit in construction camp	Visual observation	Construction Cost	Contractor/Concessionaire	NHAI/ AE
5. Flora and Fauna									
5.1 Vegetation loss due to site preparation and construction activities	- Minimize tree cutting to the extent possible. - Approx. 4568 roadside trees to be removed with prior approval of competent authority. - Compensatory plantation of 29640 at 1:3 basis as per the legal requirement - Additional median plantation & maintenance of 19980 trees - Regular maintenance of all trees planted. - Provision of LPG in construction camp as fuel source to avoid tree cutting, wherever possible. - Plantation of trees on both sides of the road to the extent possible.	Forest Conservation Act, 1980	Throughout project corridor	ROW width Number of trees for felling Compensatory plantation plan- Number of trees replanted	Proposer permission and compensatory afforestation as per legislation	Review of relevant documents, tree cutting permit, compensatory plantation plan Field observations	Road side & Compensatory plantation cost is included in project costs.	Contractor/Concessionaire, Relevant agency specialized in afforestation	NHAI/ AE

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
	- Speed control & provision of signage for wildlife movement areas must be taken - Accidental road kill record must be documented and maintained as per the format of Annexure – 8.1 - Some water bodies/Ponds slightly affected. Bridge/Flyover proposed at this location. - In the event of design changes during the construction stages additional assessments including the possibility to save trees shall be made by the Environment Expert of AE. - Road side Plantation Strategy as per IRC SP21:2009 specifications including manuring								
6. Construction Camps									
6.1 Impact associated with location	- All camps should maintain minimum distance from following: ➤ 500m from habitation ➤ 500m from water bodies where possible ➤ 500m from through traffic route where possible - The average distance between two camps should be 50 km	Design Requirement	All construction camps	Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and other construction camps	Guidelines as mentioned in column 2 should be followed	On site observation	Included in construction cost	Contractor/Concessionaire and AE	NHAI/ AE
6.2 Worker's Health in construction camp	- The location, layout and basic facility provision of each labor camp will be submitted to CSC prior to their construction. - The Contractor, no later than 30 days after the issuance of the Notice to proceed will prepare and submit a Health and Safety Plan to the Engineer (AE) for review and approval. - The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner as approved by AE. - Adequate water and sanitary latrines with septic tanks attached to soak pits shall be provided. - Preventive medical care to be provided to workers including a First-Aid kit that must be available in the camp. - Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste	The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	All construction camps	- Camp health records - Existence of proper first aid kit in camp site - Complaints from local people	One qualified doctor supported by one compounder in each camp	- Camp records - Site observation	Part of the Contractors costs	Contractor/Concessionaire	NHAI/ AE

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
	must be carried out. - No alcoholic liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. - Awareness raising to immigrant workers / local community on communicable and sexually transmitted diseases.								
7. Management of Construction Waste / Debris									
7.1 Selection of Dumping Sites	- Unproductive / waste lands shall be selected for dumping sites. - Away from residential areas and water bodies - Public perception and consent / approval from the village Panchayats and other concerned authorities has to be obtained before finalizing the location.	Design Requirement and MORT&H guidelines	At all Dumping Sites	Location of dumping sites Public complaints	No dumping without permission from Gram Sabha / Municipal Corporation	Field survey and interaction with local people	Included in construction cost.	Contractor/Concessionaire	NHAI/ AE
7.2 Reuse and Disposal of construction and dismantled waste	- The existing bitumen surface shall be utilized for paving of access roads and paving works in construction sites and camps temporary traffic diversions, and haulage routes. - Unusable and non-bituminous debris materials should be suitably disposed of in an environmentally acceptable manner at pre-designated disposal locations, with approval of the concerned authority. - The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MoRTH guidelines should be followed	MORT&H guidelines	Throughout the project corridor	Percentage of reuse of existing surface material Method and location of disposal site of construction debris	Ensure Zero contamination to land, soil and water bodies	Contractor records Field observation Interaction with local people	Included in construction cost.	Contractor/Concessionaire	NHAI/ AE
8. Traffic Management and Safety									
8.1 Management of existing traffic and safety	- Temporary traffic diversion shall be planned by the contractor and approved by the AE. - The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document. - The Contractor/Concessionaire will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. - On stretches where it is not possible to pass the	Design requirement and IRC SP:55, 2001	Throughout the project corridor especially at intersections.	Traffic management plan Safety signs on site Number of traffic accidents	Approved Traffic Management Plan should be in place before start of construction activities Zero complaints from locals	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in construction cost.	Contractor/Concessionaire	NHAI/ AE

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
	traffic on the part width of existing carriageway, temporary paved diversions will be constructed. - Restriction of construction activity to only one side of the existing road. - The contractor/concessionaire shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from AE - Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audit on safety measures.								
8.2 Pedestrians, Cattle movement	Access to the schools, temples and other public places will be maintained when construction takes place in nearby locations.	Design requirement and IRC: SP: 27-1984 IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) IRC:SP:44-1994 Highway Safety Code	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	Road signage as per IRC guideline Complaints from local people	Ensure Road signage is in place as per IRC guideline	Field observation Interaction with local people	Included in construction cost.	Contractor/Concessionaire	NHAI/ AE
8.3 Safety of Workers and accident risk from construction activities	- The contractor/concessionaire, no later than 30 days after the issuance of the Notice to proceed will prepare and submit a Health and Safety Plan to the Engineer (AE) for review and approval. - Contractor/Concessionaire to adopt and maintain safe working practices. - Usage of fluorescent and retro-reflectors signage, in local language at the construction sites - Training to workers on safety procedures and precautions. - Mandatory appointment of safety officer. - All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means shall be complied with. - Provision of PPEs to workers. - Provision of a readily available first aid unit	Child Labour Act, 1986 Indian Labour Laws	Construction sites	Availability of Safety PPEs to workers Safety signage Training records on safety Number of safety related accidents	Ensures Zero accident due to construction activities	Site observation Review records on safety training and accidents Interact with construction workers	Included in construction cost	Obligation of Contractor/Concessionaire	NHAI/ AE

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
	including an adequate supply of dressing materials. • The contractor will not employ any person below the age of 18 years for any work • Use of hazardous material should be minimized and/or restricted. . If used, hazardous material shall be handled as per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 • Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or emergencies.								
8.4 Accident risk to local community	• Restrict access to construction sites to authorized personnel. • Physical separation must be provided for movement of vehicular and human traffic. • Adequate signage must be provided for safe traffic movement		Construction sites	Safety signs and their location Incidents of accidents Complaints from local people	Ensures Zero accident due to construction activities	Site inspection Consultation with local people	Included in construction cost	Contractor/Concessionaire	NHAI/ AE
9. Site restoration and rehabilitation									
9.1 Clean-up Operations, Restoration and Rehabilitation	• Contractor/Concessionaire will prepare site restoration plans, which will be approved by the AE • The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. • All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used / affected by the project will be left clean and tidy, at the contractor's expense, to the satisfaction of the Environmental officer of AE. • All the opened borrow areas will be rehabilitated and CSC will certify in this regard.	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	Clean and restored camp sites Presence / absence of construction material / debris after completion of construction works on construction site	NOC from respective authority / land owners	Site observation Interaction with locals Issue of completion certificate after restoration of all sites	Included in construction cost.	Contractor/Concessionaire	NHAI/ AE
C. Operation stage									
1. Air quality									
1.1 Air pollution due to vehicular movement	• Roadside tree plantations shall be maintained. • Regular maintenance of the road will be done to ensure good surface condition • Vehicular air pollution will be monitored on regular basis. • Ambient air quality monitoring as per	Environmental Protection Act, 1986; The Air (Prevention and Control of	Throughout the Corridor	Ambient air quality (PM 2.5, PM10, CO, NOx, SO2) Survival rate of trees planted	No traffic congestion	As per CPCB requirements Site inspection	Included in Operation / Maintenance cost	NHAI through monitoring agency	NHAI / AE

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
	Environmental Monitoring Plan. If monitored parameters are above the prescribed limit, suitable control measures must be taken. Road signs shall be provided reminding the motorist to properly maintain their vehicles to economize on fuel consumption and protect the environment.	Pollution) Act, 1981							
2. Noise									
2.1 Noise due to movement of traffic	- Effective traffic management and good riding conditions shall be maintained to reduce the noise level throughout the stretch and speed limitation and honking restrictions may be enforced near sensitive locations. - The effectiveness of the multilayered plantation should be monitored and if needed, solid noise barrier shall be placed. - Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building close to the road - Noise monitoring as per as per Environmental Monitoring plan - Provision of Noise Barrier at sensitive receptors likely to experience high noise	Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof	Sensitive receptors	Noise levels	No horn key zone near sensitive receptor	Noise monitoring as per noise rules, 2000 Discussion with people in sensitive receptor sites	Included in Operation / Maintenance cost	NHAI through monitoring agency	NHAI / AE
3. Land and Soil									
3.1 Soil erosion at embankment during heavy rain fall.	- Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching near water bodies, slope management, etc. - Necessary measures to be followed wherever there are failures	Project requirement	At slopes and other probable soil erosion areas.	Existence of soil erosion sites Number of soil erosion sites	No soil erosion	On site observation	Included in Operation / Maintenance cost	NHAI through monitoring agency	NHAI
4. Water resources/Flooding and Inundation									
4.1 Siltation	- Regular checks shall be made for soil erosion and turfing conditions of river - Provision of side drain on both side of the road - Regular water quality monitoring	Project requirement	Near surface Water bodies	Water quality	No siltation	Site observation	Included in Operation / Maintenance cost	NHAI through monitoring agency	NHAI
4.2 Water logging due to blockage of drains, culverts	Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels / streams	Project requirement	Near surface Water bodies	Areas with water stagnation	No water logging or blockage of side drains /	Site observation	Included in Operation / Maintenance cost	NHAI through monitoring agency	NHAI

Environmental Issue / Component	Remedial Measure	Reference to laws / guidelines	Location	Monitoring indicators	Target	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
								Implementation	Supervision
or streams	Monitoring of water borne diseases due to stagnant water bodies				CD structures				
5. Flora									
5.1 Vegetation	- Planted trees, shrubs and grasses to be properly maintained - The tree survival audit to be conducted at least once in a year to assess the effectiveness	Forest Conservation Act, 1980	Project tree plantation sites	Minimum of 70% of tree survival	70% survival	Records and fields observations	Operation and Maintenance Cost	NHAI through monitoring agency	NHAI
6. Fauna									
6.1 Wildlife	- Speed control & Condition of signage for wildlife movement areas must be monitored, checked and maintained properly - Accidental road kill record must be documented and maintained as per the format of Annexure – 8.1 - Ponds are slightly affected. bridge proposed at these locations.	Wildlife Conservation Act, 1972	Throughout project corridor & Specific stretches	Number of accidental road kill of wildlife	Zero (0) accidental road kill of any Schedule I species	Audit/Review of efficacy of EMP, Condition of mitigation measures taken	Considered in EMP	Contractor/ Concessionaire,	NHAI/ AE
7. Maintenance of Right of Way and Safety									
6.1 Accident Risk due to uncontrolled growth of vegetation	- Efforts shall be made to make shoulder completely clear of vegetation - Regular maintenance of plantation along the roadside	Project requirement	Throughout the project route	Presence of and extent of vegetation growth on either side of road	Necessary pruning	Visual inspection Accident records	Included in operation / Maintenance cost	NHAI	NHAI
6.2 Accident risks associated with traffic movement.	- Traffic control measures, including speed limits, will be enforced strictly. - Further encroachment of squatters within the ROW will be prevented. - Monitor/ensure that all safety provisions included in design and construction phase are properly maintained - Tow-away facility for the break down vehicles if possible	IRC:SP:55	Throughout the Project route	Police records on accident Condition and existence of safety signs, rumble strips etc. on the road	Zero Accident	Review accident records Site observations	Included in Operation / Maintenance cost	NHAI	NHAI

Annexure 9.2: Environmental Standards & Environmental Monitoring Plan

Annexure 9.2: Environmental Standards & Environmental Monitoring Plan

Monitoring Parameters and Standards

The Environmental monitoring of the parameters involved and the threshold limits specified are discussed below:

1.1 Ambient Air Quality Monitoring (AAQM)

The air quality parameters as per CPCB standard procedure and further recommendation of the World Bank as per direction of Environment Specialist of IE shall be regularly monitored at identified locations from the initiation of the project just after award of job to concessionaire. Ambient air quality shall be monitored in accordance with the National Ambient Air Quality Standards as given in Table 1.

The location, duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed in the Environmental Monitoring Plan Table 5.

Table 1: National Ambient Air Quality Standards

Sl. No.	Pollutants	Time-weighted average	Concentration in Ambient Air		Methods of Measurement
			Industrial, Residential, Rural & other Areas	Ecologically Sensitive Areas (notified by Central Government)	
1	Sulphur Dioxide (SO ₂) µg/m ³	Annual*	50	20	- Improved West & Gaeke - Ultraviolet fluorescence
		24 hours**	80	80	
2	Nitrogen Dioxide (NO ₂) µg/m ³	Annual*	40	30	- Modified Jacob and Hochheiser (Na-Arsenite) - Chemilumiscence
		24 hours**	80	80	
3	Particulate Matter (size less than 10 µm) or PM ₁₀ µg/m ³	Annual*	60	60	- Gravimetric - TOEM - Beta attenuation
		24 hours**	100	100	
4	Particulate Matter (size less than 2.5µm) or PM _{2.5} µg/m ³	Annual*	40	40	- Gravimetric - TOEM - Beta attenuation
		24 hours**	60	60	
5	Ozone (O ₃) µg/m ³	8 hours**	100	100	- UV photometric - Chemilumiscence - Chemical Method
		1 hours**	180	180	
6	Lead (Pb) µg/m ³	Annual*	0.50	0.50	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
		24 hours**	1.0	1.0	
7	Carbon Monoxide (CO) (mg/m ³)	8 hours**	02	02	- Non Dispersive Infra-Red (NDIR) spectroscopy
		1 hours**	04	04	
8	Ammonia (NH ₃) µg/m ³	Annual*	100	100	- Chemilumiscence - Indophenol Blue Method
		24 hours**	400	400	
9	Benzene (C ₆ H ₆) µg/m ³	Annual*	05	05	- Gas chromatography based continuous analyser - Adsorption and Desorption followed by GC analysis
10	Benzo(a) Pyrene Particulate Phase only ng/m ³	Annual*	01	01	- Solvent Extraction followed by HPLC/GC analysis
11	As ng/m ³	Annual*	06	06	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
12	Ni ng/m ³	Annual*	20	20	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be compiled with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note: Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or monitoring and further investigation.

Source: MoEF Notification dated 16th November, 2009

1.2 Noise Quality Monitoring

The noise levels shall be monitored at already designated locations in accordance with the Ambient Noise Quality standards given in Table 2 below. The location, duration and the noise pollution parameters to be monitored and the responsible institutional arrangements are detailed in the Environmental Monitoring Plan Table 5.

Table 2: National Ambient Noise Quality Standards

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

Note: (1) Day time shall mean from 6.00 a.m. to 10.00 p.m. (2) Night time shall mean from 10.00 p.m. to 6.00 a.m. (3) Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority (4) Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

1.3 Water Quality Monitoring

Water quality parameters such as pH, BOD, COD, DO, coliform count, total suspended solids, total dissolved solids, Iron, Fluorides etc. shall be monitored at all identified locations from initiation of the project just after award of job to concessionaire as per standards prescribed by Central Pollution Control Board and Indian Standard Drinking water specifications IS 10500:2012, presented in Table 3 & 4 respectively. The location, duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed out in the Environmental Monitoring Plan 5.

Table 3: Primary Water Quality Standards

S. No.	Designated Best Use	Class of Water	Criteria
1	Drinking Water source (with conventional treatment)	A	Total Coliform MPN/100 ml shall be 50 or less pH between 6.5 to 8.5 Dissolved Oxygen 6 mg / l or more Biochemical Oxygen demand (BOD) 5 days 20°C 2 mg/l or less
2	Outdoor bathing (organised)	B	Total Coliform MPN/100 ml shall be 500 or less pH between 6.5 to 8.5 Dissolved Oxygen 5 mg / l or more Biochemical Oxygen demand (BOD) 5 days 20°C 3 mg/l or less
3	Drinking Water source (without conventional treatment)	C	Total Coliform MPN/100 ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4 mg / l or more Biochemical Oxygen demand (BOD) 5 days 20°C 3 mg/l or less
4	Propagation of Wildlife	D	pH between 6.5 to 8.5 for fisheries Dissolved Oxygen 4 mg / l or more Free Ammonia (as N) 1.2 mg/l or less
5	Irrigation, Industrial Cooling, Controlled Waste	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C µmhos/cm Max. 2250 Sodium absorption rations Max. 26 Boron, Max.2 mg/l

Ref: CPCB (1999). Bio mapping of rivers, Parivesh New Letter, 5 (iv), Central Pollution Control Board, Delhi, PP.20.

Table 4: Indian Standard Drinking Water Specifications: IS 10500:2012

S. No.	Substance / Characteristics	Requirement (acceptable limit)	Undesirable effect outside the desirable limit	Permissible limit in the absence of alternate source	Methods of Test (ref. To IS)	Remarks
Essential Characteristics						
1	Colour, Hazen Units, Max.	5	Above 5, consumer acceptance decreases	15	IS 3025 (Part 4)	Extended to 15 only if toxic substances, in absence of alternate sources.
2	Odour	Agreeable	-	Agreeable	IS 3025 (Part 5)	A test cold and when heated. Test at several dilution
3	Taste	Agreeable	-	Agreeable	IS 3025 (Part 7 & 8)	Test to be conducted only after safety has been established
4	Turbidity NTU, Max.	1	Above 5, consumer acceptance decreases	5	3025 (Part 10): 1984	

S. No.	Substance / Characteristics	Requirement (acceptable limit)	Undesirable effect outside the desirable limit	Permissible limit in the absence of alternate source	Methods of Test (ref. To IS)	Remarks
5	PH value	6.5 to 8.5	Beyond this range the water will not affect the mucous membrane and /or water supply system	No relaxation	IS 3025 (Part 11)	
6	Total hardness (as CaCO ₃) mg/1, Max.	300	Encrustation in water supply structures an adverse effect on domestic use	600	IS 3025 (Part 21)	
7	Iron (as Fe) mg /1 Max.	0.3	Beyond this limit taste/appearance are affected has adverse effect on domestic uses and water supply structures and promotes iron bacteria	No relaxation	IS 3025 (Part 53)	Total concentration of manganese(as Mn) and iron (as Fe) shall not exceed 0.3 mg/1
8	Chlorides (as Cl) mg/1 Max.	250	Beyond this limit, taste corrosion and palatability are affected	1000	IS 3025 (Part 32)	
9	Residual, free chloride, mg/1 Min.	0.2		1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be Min. 0.5 mg/1
Desirable Characteristics						
1	Dissolved solids mg/1 Max.	500	Beyond the palatability decreases and may cause gastro intestinal irritation	2000	IS 3025 (Part 16)	
2	Calcium (as Ca) mg/1 Max.	75	Encrustation in water supply structure and adverse effects on domestic use	200	IS 3025 (Part 40)	
3	Magnesium (as Mg) mg/1, Max.	30	Encrustation in water supply structure and adverse effects on domestic use	100	IS 3025 (Part 46)	
4	Copper (as Cu) mg/1 Max.	0.05	Beyond taste, discoloration of pipes, fitting and utensils will be caused beyond this	1.5	IS 3025 (Part 42)	
5	Manganese (as Mn) mg/1, Max.	0.1	Beyond this limit taste/appearance are affected, has adverse effect on domestic uses and water supply structures.	0.3	IS 3025 (Part 59)	
6	Sulphate (as 200 So ₂), mg/1, Max.	200	Beyond this causes gastro intestinal irritation when magnesium or sodium are present	400	IS 3025 (Part 24)	May be extended up to 400 provided (as Mg) does not exceed 30
7	Nitrate (as No ₂) mg/l, Max.	45	Beyond methaemoglobinemia this take place	No relaxation	IS 3025 (Part 34)	To be tested when pollution is suspected
8	Fluoride (as F) mg/1, Max.	1.0	Fluoride may be kept as low as possible. High fluoride may cause fluorosis	1.5	IS 3025 (Part 60)	To be tested when pollution is suspected
9	Phenolic compounds (as C ₆ H ₅ OH) mg/1, Max.	0.001	Beyond this it may cause objectionable taste and odour	0.002	IS 3025 (Part 43)	To be tested when pollution is suspected
10	Mercury (as Hg) mg/1, Max.	0.001	Beyond this the water becomes toxic	No relaxation	IS 3025 (Part 48)	To be tested when pollution is suspected
11	Cadmium (as cd), mg/1, Max.	0.003	Beyond this the water becomes toxic	No relaxation	IS 3025 (Part 41)	To be tested when pollution is suspected

S. No.	Substance / Characteristics	Requirement (acceptable limit)	Undesirable effect outside the desirable limit	Permissible limit in the absence of alternate source	Methods of Test (ref. To IS)	Remarks
12	Selenium, (as Se). mg/l, Max.	0.01	Beyond this the water becomes toxic	No relaxation	IS 3025 (Part 56)	To be tested when pollution is suspected
13	Arsenic (As) mg/1, Max.	0.01	Beyond this the water becomes toxic	0.05	IS 3025 (Part 37)	To be tested when pollution is suspected
14	Cyanide (as CN) mg/1, Max.	0.05	Beyond this the water becomes toxic	No relaxation	IS 3025 (Part 27)	To be tested when pollution is suspected
15	Lead (as Pb), mg/1, Max.	0.01	Beyond this the water becomes toxic	No relaxation	IS 3025 (Part 47)	To be tested when pollution is suspected
16	Zinc (as Zn) mg/1, Max.	5	Beyond this limit it can cause astringent taste and an opalescence in water	15	IS 3025 (Part 49)	To be tested when pollution is suspected
17	Anionic detergents (as MBAS) mg/1, Max.	0.2	Beyond this it can cause a light froth in water	1	Annex K of IS 13428	To be tested when pollution is suspected
18	Chromium (as Cr6+) mg/1, Max.	0.05	May be carcinogenic above this limit	No relaxation	IS 3025 (Part 52)	To be tested when pollution is suspected
19	Poly nuclear aromatic hydrocarbons (as PAH) mg/1, Max.	0.0001	May be carcinogenic above this limit	No relaxation	APHA 6440	-
20	Mineral oil mg/1, Max.	0.5	Beyond this limit undesirable taste and odour after chlorination take place.	0.03	IS 3025 (Part 39)	-
21	Pesticides mg/1, Max.	-	Toxic	-	-	-
22	Radioactive material	-	-	-	IS 14194	-
23	Alpha emitters bq/1, Max.	0.1	-	No Relaxation	-	-
24	Beta emitter pci/1, Max.	1.0	-	No Relaxation	-	-
25	Total alkalinity (as CaCO ₃), mg/l, max	200	Beyond this limit taste becomes unpleasant	600	IS 3025 (Part 23)	-
26	Aluminium (as Al) mg/1, Max.	0.03	Cumulate effect is reported to cause dementia	0.2	IS 3025 (Part 55)	-
27	Boron mg/1, Max.	0.5	-	1.0	IS 3025 (Part 57)	-

Source: Indian Standard Drinking Water Specification – IS 10500:2012

Environmental Monitoring Plan

The environmental monitoring plan is given below in table 5.

Table 1: Environmental Monitoring Plan

Environmental Components	Monitoring			Location	Frequency	Institutional Responsibility	
	Parameters	Special Guidance	Standards			Implementation	Supervision
Air	PM2.5, PM10, SO ₂ , NO _x , CO	As per CPCB guidelines	The Air (Prevention and Control of Pollution) Rules, CPCB, 1982	At hot mix plant, batching plant, sensitive areas and chainage as directed by Environment Specialist of Monitoring Consultant	4 locations twice a season for three season in a year for 2 years for construction period and 3 locations once in a season for three season in a year for 10 years during operation period	Contractor/Concessionaire through NABL/MOEF&CC approved monitoring agency	NHAI, IE
Water	pH, BOD, COD, TDS, TSS, DO, Total coliform, Conductivity, Oil & Grease other Baseline Parameters	Grab sample collected from source and analyze as per standard methods for examination of water and wastewater	Water quality standards by CPCB	River tributaries, roadside ponds and ground water at construction campsites and chainages as directed by Environment Specialist of Monitoring Consultant	4 Locations twice in a year (pre & Post Monsoon) for 2 years for construction period and 2 Locations twice in a year (pre & Post Monsoon) for 10 years for operation period	Contractor/Concessionaire through NABL/MOEF &CC approved monitoring agency	NHAI, IE
Noise Levels	Noise level for day and night on dB(A) scale	In free field at 1m distance from the equipment to be monitored	Noise standard by CPCB	At equipment yards, camp and villages along the alignment and chainages as directed by Environment Specialist of Monitoring Consultant	4 Locations once per season for three season in a year for 2 years for construction period and 3 Locations once in season for three season in a year for 10 years during construction period	Contractor/Concessionaire through NABL/MOEF&CC approved monitoring agency	NHAI, IE
Soil quality	Monitoring of NPK & heavy metals, grease and other Baseline Parameters		ICAR Criteria of Soil Quality	Sensitive Landuse and chainages as directed by Environment Specialist of Monitoring Consultant	3 Locations twice in a year for 2 years for construction period and 2 Locations once in a year for 10 years for operation period	Contractor/Concessionaire through NABL/MOEF&CC approved monitoring agency	NHAI, IE
Road side plantation	Monitoring of felling of trees	It should be ensured that the marked trees are felled only	As given in the tree evaluation/EIA report	All along the corridor	During the felling of trees	Forest department	NHAI, IE
	Survival rate of trees, success of re-vegetation	The number of trees surviving during each visit should be compared with the number of saplings planted	The survival rate should be at least 75% below which re-plantation should be done	At locations of compensatory afforestation	For 3 years after completion of construction period	NHAI	NHAI
Health & Safety	Accidental Road Kill	Format attached as Annexure 8.1	Zero accidental hours to be maintained during the Construction phase.	Entire Project Stretch	As and when required	Contractor/Concessionaire	NHAI, IE
	Condition of Roadside Signage	Visual observation	as per IRC code	Roadside Signage Locations	At least twice in a year		

Environmental Components	Monitoring			Location	Frequency	Institutional Responsibility	
	Parameters	Special Guidance	Standards			Implementation	Supervision
	Plying Vehicular speed	Random Speed checking	-				

Annexure 11.1: Accreditation certificate of
Shree Krishna Analytical Services PVT.
LTD.



National Accreditation Board for
Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

SHREE KRISHNA ANALYTICAL SERVICES PVT. LTD.

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

**"General Requirements for the Competence of Testing &
Calibration Laboratories"**

for its facilities at

A-5/4, MAYAPURI INDUSTRIAL AREA, PHASE-II, NEW DELHI, DELHI, INDIA

in the field of

TESTING

Certificate Number: TC-8932

Issue Date: 14/08/2020

Valid Until: 15/07/2022

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : SHREE KRISHNA ANALYTICAL SERVICES PVT. LTD.

Signed for and on behalf of NABL



N. Venkateswaran
Chief Executive Officer

F. No. Q-15018/22/2017-CPW
Government of India
Ministry of Environment, Forest and Climate Change
(CP Division)

Agni-233, Indira Paryavaran Bhavan,
Jor Bagh Road,
New Delhi - 110 003.
Dated, the 19th February, 2019

To
M/s Shree Krishna Analytical Services
A-5/4, Phase-II
Mayapuri Industrial Area
New Delhi-110064

Subject: -New Recognition of M/s Shree Krishna Analytical Services, A-5/4, Phase-II, Mayapuri Industrial Area, New Delhi-110064 as Environmental Laboratory under the Environment (Protection) Act, 1986 – regarding.

Sir,

I am directed to refer to your application submitted vide letter No. SKAS/1718/002, dated 25th April, 2017 for new recognition of your laboratory under Environment (Protection) Act, 1986. Based on the recommendations of the Expert Committee for Recognition of Environmental Laboratories in its 55th & 56th meetings held on 17.09.2018 and 23.01.2019 respectively and your acceptance of the revised terms and conditions at Annexure-III & IV of the Guidelines for recognition of Environmental Laboratories, this Ministry approves the new recognition of M/s Shree Krishna Analytical Services, A-5/4, Phase-II, Mayapuri Industrial Area, New Delhi-110064 for five years, as shall be notified in the Gazette of India.

2. As sought in your aforementioned application, M/s Shree Krishna Analytical Services, New Delhi may undertake the following tests:

- i. **Physical Tests:** Conductivity, Colour, pH, Fixed & volatile solids, Total solids, Total dissolved solids, Total suspended solids, Turbidity, Temperature, Velocity & discharge measurement of industrial effluent stream, Odour, Salinity, Settleable solids and Sludge Volume Index (SVI)
- ii. **Inorganic (General & Non-metallic):** Acidity, Alkalinity, Ammonical nitrogen, Chloride, Chlorine residual, Dissolved oxygen, Fluoride, Total hardness, Total kjehldal nitrogen (TKN), Nitrite nitrogen, Nitrate nitrogen, Phosphate, Sulphate, Carbon dioxide, Chlorine demand, Sulphite, Silica, Cyanide and Sulphide.
- iii. **Inorganic (Trace metals):** Boron, Cadmium, Calcium, Chromium Total, Chromium Hexavalent, Copper, Iron, Lead, Magnesium, Mercury, Nickel, Potassium, Sodium, Sodium absorption ratio, Zinc, Arsenic, Aluminium, Manganese, Selenium and Silver.
- iv. **Organics (General) and Trace Organics:** Bio-chemical oxygen demand (BOD), Chemical oxygen demand (COD), Oil & grease, Phenol, Pesticide (Organo-chlorine, Organo nitrogen-phosphorous), Surfactants, Tannin & lignin, Polynuclear aromatic hydrocarbon (PAH) each, Organic Carbon (in solid) and Carbon/Nitrogen ratio.
- v. **Microbiological:** Total coliform, Faecal coliform, Faecal streptococci, E. coli, Total plate count.
- vi. **Toxicological:** Bioassay method for evaluation of toxicity using fish, Bio-accumulation, bio magnification and bio-transformation studies and Measurement of toxicity factor using zebra fish.
- vii. **Biological:** Benthic organism identification and count, Macrophytic identification, Planktonic identification count and Chlorophyll.
- viii. **Hazardous Waste:** Preparation of leachate (TCLP extract/water extract, Corrosivity, Ignibility (Flash point), Toxicity, Measurement of heavy metals/pesticides in the waste/leachate.
- ix. **Soil/ Sludge/ Sediment and Solid Waste:** Boron, Cation Exchange Capacity (CEC), Electrical Conductivity, Nitrogen available, Organic carbon/ matter (chemical method), pH, Phosphorous

(available), Phosphate (ortho), Phosphate (total), Potassium, SAR in soil extract, Sodium, Soil moisture, TKN, Calorific value, Ammonia, Bicarbonate, Calcium, Calcium carbonate, Chloride, Colour, Exchangeable sodium percentage (ESP), Gypsum Requirement, Heavy metal, Magnesium, Nitrate, Nitrite, Pesticide, Potash(available), Sulphate, Sulphur, TOC, Total water soluble salt and Water holding capacity.

- x. **Ambient Air/ Fugitive Emissions:** Nitrogen dioxide (NO₂), Sulphur dioxide (SO₂), Total suspended particulate matter, particulate matter (PM₁₀), Ammonia, Carbon monoxide, Chlorine, Fluoride, Lead, Ozone, Benzene Toluene Xylene(BTX), Polycyclic aromatic hydrocarbon(PAH) Benzo-a-pyrene and PM_{2.5}.
- xi. **Stack Gases/ Source Emission:** Particulate matter, Sulphur dioxide, Velocity & flow, Carbon dioxide, Carbon monoxide, Temperature, Oxygen, Oxides of nitrogen, Ammonia, Fluoride (Particulate), Fluoride (Gaseous), Total Hydro Carbon, Hydrogen sulphide and Carbon disulphide.
- xii. **Noise Level:** Noise level measurement (20 to 140 dba) and Ambient noise & source specific noise
- xiii. **Meteorological:** Ambient temperature, Wind direction, Wind speed, Relative Humidity, Solar radiation and Rain fall

3. Further, the following analysts have been approved for recognition as Government Analysts.

- (i) Mr. Vinay Kumar
- (ii) Mr. Narendra Kumar
- (iii) Mr. Surjeet Das

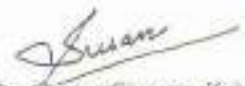
4. The laboratory shall compulsorily participate in the Analytical Quality Control (AQC) exercise conducted by the Central Pollution Control Board (CPCB) at least once a year to ascertain the capability of the laboratory and analyses carried out and shall submit quarterly progress reports to this Ministry.

5. Periodic surveillance of the recognized environmental laboratory will be undertaken by this Ministry/ CPCB to assess its proper functioning, systematic operation and reliability of data generated at the laboratory.

6. It is also mandatory for the laboratory to have requisite accreditations of the NABL/ ISO 9001 and OHSAS and its renewal as per accreditation rules. Permission in para 2 above is subject to such accreditations and renewal, as applicable.

7. The laboratory should compulsorily follow the accepted Terms & Conditions. In case of serious non-compliance of any of the Terms and Conditions, the laboratory may be black-listed for a minimum period of two years and civil/ criminal proceedings, as applicable, may be initiated for performing functions on behalf of the Government in an unauthorized manner.

Yours faithfully,


(Dr. Susan George K.)
Scientist 'D'

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Copy to:

- 1. Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, New Delhi - 110032.
- 2. Member Secretary, Delhi Pollution Control Board, 4th & 5th Floor, ISBT Building, Kashmere Gate, New Delhi, Delhi 110006.
- 3. Additional Principal Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (CZ), Kendriya Bhawan, 5th Floor, Sector H, Aliganj, Lucknow-226020.
- 4. Director, IT Division, MoEF&CC, New Delhi-110003: for uploading on MoEF&CC website



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

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S.No	Discipline / Group	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of tests performed	Test Method Specification against which tests are performed and / or the techniques / equipment used
84	BIOLOGICAL- FOOD AND AGRICULTURAL PRODUCTS	Sweet potato flour	E.coli	IS 5887 (part 1)
85	BIOLOGICAL- FOOD AND AGRICULTURAL PRODUCTS	Turmeric whole & ground	Salmonella	IS 5887 (part 3)
86	BIOLOGICAL- WATER	Drinking water	Coliform count	IS 15185
87	BIOLOGICAL- WATER	Drinking water	E.coli	IS 15185
88	BIOLOGICAL- WATER	Drinking water	Faecal coliform	IS 1622
89	BIOLOGICAL- WATER	Packaged Drinking water	E.coli	IS 15185
90	BIOLOGICAL- WATER	Packaged drinking water	Salmonella	FSSAI Manual of methods of analysis of food and water
91	BIOLOGICAL- WATER	Packaged Natural Mineral Water	E.Coli	IS 15185
92	BIOLOGICAL- WATER	Packaged natural mineral water	Salmonella	FSSAI Manual Method of analysis of foods & water
93	BIOLOGICAL- WATER	Water used in food processing	E.coli	IS 15185
94	BIOLOGICAL- WATER	water used in food processing	Faecal Coliforms	IS 1622
95	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Ammonia	NAAQMS Monitoring & Analysis Guidelines Volume 1 Colormetric (by UV)
96	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient air	Arsenic as As	NAAQMS Monitoring & Analysis Guidelines ,Volume -I CPCB,AAS Method after sampling on EPM 2000 or Equivalent filter Paper
97	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient air	Benzene (C6H6)	IS 5182(Part-11) :Followed by GC-FID With Capillary Column
98	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Benzo(a)Pyrene(BaP)	IS 5182(Part-12),Followed GC-FID With Capillary Column
99	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Carbon Monoxide (CO)	IS-5182(Part-10) By GC FID
100	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient air	Lead (Pb)	IS 5182(Part-22),Followed By AAS method after Sampling on EPM 2000 or equivalent filter paper
101	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient air	Nickel (Ni)	NAAQMS Monitoring & Analysis Guidelines ,Volume -I CPCB,AAS Method after sampling on EPM 2000 or Equivalent filter Paper



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102	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient air	Nitrogen dioxide (No2)	IS- 5182 (Part 6):,Modified Jacob & Hochheiser method (Sodium Arsenite)
103	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient air	Ozone	IS -5182 (Part -9), UV Photometric method
104	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient air	Particulate matter (PM 2,5)	NAAQMS Monitoring & Analysis Guidelines ,Volume -I CPCB, Gravimetric method
105	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient air	Respirable suspended particulate matter (PM 10)	IS -5182 (Part 23)NAAQMS Monitoring & Analysis Guidelines ,Volume -I CPCB, Gravimetric method
106	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient air	Sulphur dioxide (So2)	IS 5182 (Part 2):2001,Improved west and Greake Method
107	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Noise	Ambient Noise	IS 9876:1981
108	CHEMICAL- ATMOSPHERIC POLLUTION	Source Machine Noise	Source Machine Noise	IS 10988
109	CHEMICAL- ATMOSPHERIC POLLUTION	Stationary Source	Carbon Dioxide, (CO2)	IS 13720:b
110	CHEMICAL- ATMOSPHERIC POLLUTION	Stationary Source	Carbon monoxide (CO)	IS 13270-b-1992(By Gas Chromatography)
111	CHEMICAL- ATMOSPHERIC POLLUTION	Stationary Source	Oxygen (O2)	IS 13270 -b(By Gas Chromatography)
112	CHEMICAL- ATMOSPHERIC POLLUTION	Stationary source	Sulphur Dioxide (SO2)	IS 11255(Part-2)
113	CHEMICAL- ATMOSPHERIC POLLUTION	Stationary source /stack/chimney emission	Oxide of Nitrogen (NOX) as No2	IS 11255 (Part 7)
114	CHEMICAL- ATMOSPHERIC POLLUTION	Stationary Source /Stack /Chimney emission	Particulate matter (PM)	IS 11255 (Part 1)
115	CHEMICAL- DRUGS & PHARMACEUTICALS	Amoxicillin	Dissolution (By UV)	IP page no.1231,Vol II
116	CHEMICAL- DRUGS & PHARMACEUTICALS	Ascorbic Acid	Appearance of Solution	IP page no.1270 ,Vol II
117	CHEMICAL- DRUGS & PHARMACEUTICALS	Ascorbic Acid	Assay (By Titration)	IP Page No 1270,Vol II
118	CHEMICAL- DRUGS & PHARMACEUTICALS	Ascorbic Acid	Light Absorption	IP Page No 183,184, Vol II



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510	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Wheat Atta	Moisture	IS 115
511	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Wheat Atta	Protein	IS 7219
512	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Wheat Atta	Starch	IS 4706
513	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Wheat Atta	Total Ash	IS 1155
514	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Arsenic as As	APHA , 3110- B, 23rd edition
515	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Lead as Pb	APHA, 3110- B, 23rd edition
516	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Mercury as Hg	APHA , 3110- B, 23rd edition
517	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Appearance	APHA, Page 2110 , 23rd edition,
518	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Color	APHA, 2120-B, 23rd edition
519	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Cyanide as CN	APHA, 4500-CN- E, 23rd edition
520	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Fluoride as F	APHA, 4500-F, D, 23rd edition
521	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Nitrate Nitrogen as N	IS 3025 (Part-34)
522	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Odour	IS 3025 (Part 5)
523	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Oil & Grease	IS 3025 (Part- 39)
524	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Organic Volatile Solids	IS 3025 (Part 18)
525	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	pH	IS 3025 (Part 11)
526	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial / Domestic Effluent	Sulfate as So ₄	IS 3025 (Part -24)



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527	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial Domestic Effluent	Sulphide as S	IS 3025 (Part 29)
528	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial Domestic Effluent	Sulphite as So ₃	IS 3025 (Part 28)
529	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial Domestic Effluent	Temperature	IS 3025 (Part -9)
530	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial Domestic Effluent	Total Dissolved Solids (TDS)	IS 3025 (Part 16)
531	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial Domestic Effluent	Total Hardness as CaCo ₃	IS 3025 (Part- 21)
532	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial Domestic Effluent	Total Solids (TS)	IS 3025 (Part 15)
533	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial Domestic Effluent	Total Suspended Matter (TSS)	IS 3025 (Part -17)
534	CHEMICAL- POLLUTION & ENVIRONMENT	Industrial Domestic Effluent	Turbidity	IS 3025 (Part 10)
535	CHEMICAL- POLLUTION & ENVIRONMENT	Soil /Sediments	C/N Ratio	SOP/SKAS/SOIL/06/Ref:Soil chemical Analysis by M.L. Jackson
536	CHEMICAL- POLLUTION & ENVIRONMENT	Soil /Sediments	Exchangeable Magnesium	SOP/SKAS/SOIL/04/Ref:Soil chemical Analysis by M.L. Jackson
537	CHEMICAL- POLLUTION & ENVIRONMENT	Soil /Sediments	Total Soluble Sulfate as So ₄	IS 2720 (Part 27):1977
538	CHEMICAL- POLLUTION & ENVIRONMENT	Soil /Sediments	Zinc as Zn	USEPA 3050-B PP 1-12,Dec ,Second Revision (Acid Digestion)
539	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Ammonical Nitrogen as N	IS 14684
540	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Bulk density	IS 2720 (Part 28/29)
541	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Calcium Carbonate	IS 2720 (Part 23)
542	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Cation Exchange Capacity	IS 2720
543	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Chloride as Cl	SOP/SKAS/SOIL/05(Vohland method)
544	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Electric Conductivity	IS 14767



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545	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Exchangeable Potassium	SOP/SKAS/SOIL/01/Ref:Soil chemical Analysis by M.L. Jackson
546	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/sediments	Exchangeable Calcium	SOP/SKAS/SOIL/03,Ref. Soil Chemical Analysis by M.L. Jackson:
547	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Exchangeable sodium	SOP/SKAS/SOIL/02/Ref:Soil chemical Analysis by M.L. Jackson
548	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Moisture	IS 2720(Part-2):1973
549	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Organic Matter/Carbon	IS 2720 (Part -22):1972
550	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	pH	IS 2720 (Part 26):1987
551	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Phosphorous as P	IS 10158
552	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Sodium Absorption Ratio	IS 11624
553	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Soil Texture	SOP/SKAS/SOIL/07
554	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	TKN as N	IS 10158
555	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Total Soluble Solids	IS 2720 (Part 21)
556	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Water Holding Capacity	IS 14765
557	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Cadmium as Cd	USEPA 3050-B PF 1-12,Dec ,Second Revision (Acid Digestion)
558	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Chromium as Cr	USEPA 3050-B PF 1-12,Dec ,Second Revision (Acid Digestion)
559	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Copper as Cu	USEPA 3050-B PF 1-12,Dec ,Second Revision (Acid Digestion)
560	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sediments	Iron as Fe	USEPA 3050-B PF 1-12,Dec ,Second Revision (Acid Digestion)



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561	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/sendiments	Lead as Pb	USEPA 3050-B PF 1-12,Dec ,Second Revision (Acid Digestion)
562	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sendiments	Manganese as Mn	USEPA 3050-B PF 1-12,Dec ,Second Revision (Acid Digestion)
563	CHEMICAL- POLLUTION & ENVIRONMENT	Soil/Sendiments	Nickel as Ni	USEPA 3050-B PF 1-12,Dec ,Second Revision (Acid Digestion)
564	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water Industrial /domestic effluent	Specific Conductivity	IS 3025 (Part -14) ,
565	CHEMICAL- POLLUTION & ENVIRONMENT	waste water (industrial / Domestic effluent	Alkalinity as CaCo ₃ (Phenolphthalein & total)	IS 3025 (Part- 23)
566	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Industrial /Domestic effluent)	Acidity as CaCo ₃	IS 3025 (Part -22),
567	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Industrial /Domestic effluent)	Residual Free Chlorine as Cl ₂	IS 3025 (Part 26):
568	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Industrial /Domestic effluent)	Total Suspended Matter (TSS)	IS 3025 (Part -17)
569	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Industrial /Domestic effluent)	Total Dissolve Solids (TDS)	IS 3025 (Part 16),
570	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Aluminium as Al	IS 3025 (Part-55)
571	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Ammonical Nitrogen as N	APHA ,4500-NH ₃ -B&C,23rd edition
572	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Biochemical Oxygen Demand (BOD) (3 Days at 27 Degree C	IS 3025 (Part -44)
573	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Industrial/Domestic Effluent)	Calcium as Ca	IS 3025(Part-40),
574	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Chemical Oxygen Demand (COD)	IS 3025 (Part -58):
575	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Chloride as Cl	IS 3025 (Part-32),
576	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Chromium as Cr+6 (Hexavalent)	IS 3025 (Part -52):
577	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Dissolved Oxygen as O ₂	IS 3025 (Part -38)
578	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Inorganic Fixed Solids	APHA,2540-E,23rd edition



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579	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Iron as Fe	APHA,3500-Fe-B, 23rd edition
580	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Magnesium as Mg	APHA,3500-Mg-B, 23rd edition
581	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Nitrite as NO ₂	IS 3025 (Part -34),
582	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Phenolic Compound as C ₆ H ₅ OH	APHA,5530-B-C&E,23rd edition
583	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Phosphate as PO ₄	APHA,4500-P-C, 23rd edition
584	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Potassium as K	IS 3025 (Part -45),
585	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Silica as SiO ₂	APHA,4500-SiO ₂ -C,23rd edition
586	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Sodium as Na	IS 3025 (Part -45),
587	CHEMICAL- POLLUTION & ENVIRONMENT	Waste water (Industrial/Domestic Effluent)	Total Kjeldahl Nitrogen as N	IS 3025 (Part -34),
588	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Gelling Agent (Arabic Gum, Tragacanth gum, Gum Karaya, Gum Ghatti)	Arsenic	SKAS-STP-INST-002
589	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Gelling Agent (Arabic Gum, Tragacanth gum, Gum Karaya, Gum Ghatti)	Cadmium	SKAS-STP-INST-001
590	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Gelling Agent (Arabic Gum, Tragacanth gum, Gum Karaya, Gum Ghatti)	Copper	FSSAI Lab Manual- Metals, 3.1
591	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Gelling Agent (Arabic Gum, Tragacanth gum, Gum Karaya, Gum Ghatti)	Lead	SKAS-STP-INST-001
592	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Gelling Agent (Arabic Gum, Tragacanth gum, Gum Karaya, Gum Ghatti)	Mercury	SKAS-STP-INST-002
593	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Salt (Edible Common Salt, Table Salt, Iodized Salt, Vacuum Evaporated Iodized Salt, Iron Fortified Salt, Iron fortified iodide salt, Potassium Iodate)	Lead	SKAS-STP-INST-001
594	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Salt (Edible Common Salt, Table Salt, Iodized Salt, Vacuum Evaporated Iodized Salt, Iron Fortified Salt, Iron fortified iodide salt, Potassium Iodate)	Arsenic	SKAS-STP-INST-002
595	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Salt (Edible Common Salt, Table Salt, Iodized Salt, Vacuum Evaporated Iodized Salt, Iron Fortified Salt, Iron fortified iodide salt, Potassium Iodate)	Cadmium	SKAS-STP-INST-001



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596	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Salt (Edible Common Salt, Table Salt, Iodized Salt, Vacuum Evaporated Iodized Salt, Iron Fortified Salt, Iron fortified iodide salt, Potassium Iodate)	Copper	FSSAI Lab Manual- Metals, 3.1
597	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Salt (Edible Common Salt, Table Salt, Iodized Salt, Vacuum Evaporated Iodized Salt, Iron Fortified Salt, Iron fortified iodide salt, Potassium Iodate)	Mercury	SKAS-STP-INST-002
598	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Tea (BlackTea, Herbal Tea, Kangra Tea, Green Tea, Tea Leaves)	Arsenic	SKAS-STP-INST-002
599	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Tea (BlackTea, Herbal Tea, Kangra Tea, Green Tea, Tea Leaves)	Cadmium	SKAS-STP-INST-001
600	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Tea (BlackTea, Herbal Tea, Kangra Tea, Green Tea, Tea Leaves)	Copper	FSSAI Lab Manual- Metals, 3.1
601	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Tea (BlackTea, Herbal Tea, Kangra Tea, Green Tea, Tea Leaves)	Lead	SKAS-STP-INST-001
602	CHEMICAL- RESIDUES IN FOOD PRODUCTS	Tea (BlackTea, Herbal Tea, Kangra Tea, Green Tea, Tea Leaves)	Mercury	SKAS-STP-INST-002
603	CHEMICAL- WATER	Construction Water	Chloride	IS 3025 (Part 32)
604	CHEMICAL- WATER	Construction Water	Inorganic Solids	IS 3025 (Part 18)
605	CHEMICAL- WATER	Construction Water	Organic Solids	IS 3025 (Part 18),RA
606	CHEMICAL- WATER	Construction Water	pH	IS 3025 (Part)1983,RA
607	CHEMICAL- WATER	Construction Water	Sulphate as So3	IS 3025 (Part 24)1986,RA
608	CHEMICAL- WATER	Construction Water	Total Suspended Matter (TSS)	IS 3025 (Part 17)
609	CHEMICAL- WATER	Construction Water	Water Neutralization (To Neutralize 100 ml sample of water using 0.02 N NaOH)	IS 3025 (Part 22)
610	CHEMICAL- WATER	Construction Water	Water Neutralization to neutralize 100 ml sample of water using 0.02 N H2SO4	IS 3025 (Part 22)
611	CHEMICAL- WATER	Drinking Water	Acidity as CaCo3	IS 3025 (Part 22)
612	CHEMICAL- WATER	Drinking Water	Alkalinity as CaCo3 (Phenolphthalein and Total Alkalinity)	IS 3025 (Part 23)
613	CHEMICAL- WATER	Drinking Water	Aluminium as Al	IS 3025 (Part 55)
614	CHEMICAL- WATER	Drinking Water	Ammonia as NH3	IS 3025 (Part 34) ,
615	CHEMICAL- WATER	Drinking Water	Ammonical Nitrogen as N	IS 3025 (Part 34) ,
616	CHEMICAL- WATER	Drinking Water	Anionic surface active agents as MBAS	IS 13428 (Annexure K)



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617	CHEMICAL- WATER	Drinking Water	Arsenic as As	IS 3025 (Part 37)
618	CHEMICAL- WATER	Drinking Water	Bi carbonate as HCCo3	APHA ,2320 -B , 23rd edition
619	CHEMICAL- WATER	Drinking Water	Boron As B	IS 3025 (Part 57)
620	CHEMICAL- WATER	Drinking Water	Cadmium as Cd	APHA, 3110- B,23rd edition 2017
621	CHEMICAL- WATER	Drinking Water	Carbonate as Co3	APHA, 2320 - B ,23rd edition
622	CHEMICAL- WATER	Drinking Water	Chloride	IS 3025 (Part 32)
623	CHEMICAL- WATER	Drinking Water	Chromium as Cr (total)	APHA, 3110 -B ,23rd edition
624	CHEMICAL- WATER	Drinking Water	Chromium as Cr +6 (Hexavalent)	IS 3025 (Part 52)
625	CHEMICAL- WATER	Drinking Water	Color	APHA,2120-B,23rd edition
626	CHEMICAL- WATER	Drinking Water	Copper as Cu	APHA, 3110 -B,23rd edition 2017
627	CHEMICAL- WATER	Drinking Water	Cyanide as CN	APHA, 4500 - CN -B,C&E, 23rd edition
628	CHEMICAL- WATER	Drinking Water	Inorganic Fixed Solids	APHA,2540-E, 23rd edition 1984
629	CHEMICAL- WATER	Drinking Water	Lead as Pb	APHA, 3110- B,23rd edition 1994
630	CHEMICAL- WATER	Drinking Water	Manganese as Mn	APHA,3110- B,23rd edition
631	CHEMICAL- WATER	Drinking Water	Mercury as Hg	APHA,3110-B, 23rd edition
632	CHEMICAL- WATER	Drinking Water	Mineral Oil	IS 3025 (Part 39)
633	CHEMICAL- WATER	Drinking Water	Nickel as Ni	APHA,3110-B 23rd edition
634	CHEMICAL- WATER	Drinking Water	Nitrate as No3	IS 3025 (Part 34)
635	CHEMICAL- WATER	Drinking Water	Odour	IS 3025 (Part 5)
636	CHEMICAL- WATER	Drinking Water	Organic Volatile Solid	APHA ,2540-E,23rd edition 1984
637	CHEMICAL- WATER	Drinking Water	pH	IS 3025 (Part 11)
638	CHEMICAL- WATER	Drinking Water	Phenolic compound as C6H5OH	APHA 5530 -B , C & E 23rd edition
639	CHEMICAL- WATER	Drinking Water	Phosphate as Po4	APHA,4500 -P-C,23rd edition
640	CHEMICAL- WATER	Drinking Water	Potassium as K	IS 3025 (Part 54)
641	CHEMICAL- WATER	Drinking Water	Silica as SiO2	APHA, 4500 -SiO2 -C, 23rd edition



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

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Accreditation Standard ISO/IEC 17025:2017

Certificate Number TC-8932

Validity 14/08/2020 to 15/07/2022

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Last Amended on 22/10/2021

S.No	Discipline / Group	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of tests performed	Test Method Specification against which tests are performed and / or the techniques / equipment used
642	CHEMICAL- WATER	Drinking Water	Sodium as Na	IS 3025 (Part 45)
643	CHEMICAL- WATER	Drinking Water	Sulfate as SO ₄	IS 3025 (Part 24)
644	CHEMICAL- WATER	Drinking Water	Sulfide as S	IS 3025 (Par 29)
645	CHEMICAL- WATER	Drinking Water	Sulphite as SO ₃	IS 3025 (Part 28)
646	CHEMICAL- WATER	Drinking Water	Temprature	IS 3025 (Part 9)
647	CHEMICAL- WATER	Drinking Water	Total kjeldahl Nirtrogen as N	IS 3025(Part-34)
648	CHEMICAL- WATER	Drinking Water	Total Solids (TS)	IS 3025 (Part 15),
649	CHEMICAL- WATER	Drinking Water	Turbidity	IS 3025 (Part 10)
650	CHEMICAL- WATER	Drinking Water	Zinc as Zn	APHA 3110-B,23rd edition
651	CHEMICAL- WATER	Food Process water	Arsenic (as As)	APHA, 3110- B,23rd edition
652	CHEMICAL- WATER	Food Process Water	Chloride (as Cl)	IS 3025(Part -32)
653	CHEMICAL- WATER	Food Process water	Chromium (as Cr+6)	IS 3025 (Part-52)
654	CHEMICAL- WATER	Food Process Water	Colour	APHA,2120-B,23rd edition
655	CHEMICAL- WATER	Food Process water	Copper as Cu	,APHA,3110- B,23rd edition
656	CHEMICAL- WATER	Food Process Water	Cyanide (as CN)	APHA,4500-CN-B,C&E, 23rd edition
657	CHEMICAL- WATER	Food Process Water	Fluoride (as F)	APHA,4500-F-D, 23rd edition
658	CHEMICAL- WATER	Food Process water	Iron as Fe	APHA-3500-Fe-B, 23rd edition
659	CHEMICAL- WATER	Food Process water	Lead (as Pb)	APHA,3110- B,23rd edition
660	CHEMICAL- WATER	Food Process Water	Magnesium as Mg	APHA,3500-Mg -B ,23rd edition
661	CHEMICAL- WATER	Food Process water	Manganese(as Mn)	APHA,3110- B,23rd edition
662	CHEMICAL- WATER	Food Process water	Nitrate (as NO ₃)	APHA,4500-N-,23rd edition
663	CHEMICAL- WATER	Food Process Water	Odor	APHA,2150-B,23rd edition
664	CHEMICAL- WATER	Food Process Water	pH	IS 3025(Part -11):
665	CHEMICAL- WATER	Food Process water	Phenolic Compounds (as C ₆ H ₅ OH)	APHA,5530-B,C&E, 23rd edition
666	CHEMICAL- WATER	Food Process Water	Sulphate (as SO ₄)	IS 3025(Part -24)
667	CHEMICAL- WATER	Food Process Water	Total Solids	IS 3025(Part -15)
668	CHEMICAL- WATER	Food Process Water	Turbidity	IS 3025(Part-10):
669	CHEMICAL- WATER	Food Process water	Zinc (as Zn)	APHA,3110- B, 23rd edition
670	CHEMICAL- WATER	Surface Water	Anionic surface Active Detergent as MBAS	Annexure K of IS 13428:



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S.No	Discipline / Group	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of tests performed	Test Method Specification against which tests are performed and / or the techniques / equipment used
671	CHEMICAL- WATER	Surface Water	Arsenic as As	APHA,3110- B, 23rd edition
672	CHEMICAL- WATER	Surface Water	Cadmium as Cd	APHA,3110-B 23rd edition
673	CHEMICAL- WATER	Surface Water	Chloride as Cl	IS 3025(Part-32)
674	CHEMICAL- WATER	Surface Water	Chromium as Cr+6	IS 3025(Part-52)
675	CHEMICAL- WATER	Surface Water	Colour	APHA,2120-B 23rd edition
676	CHEMICAL- WATER	Surface Water	Copper as Cu	APHA,3110-B 23rd edition
677	CHEMICAL- WATER	Surface Water	Cyanide as CN	APHA,4500 -CN-B,C&E ,23rd edition
678	CHEMICAL- WATER	Surface Water	Dissolved Oxygen as O ₂	IS 3025(Part-38)
679	CHEMICAL- WATER	Surface Water	Fluoride as F	APHA,4500 -F-D,23rd edition
680	CHEMICAL- WATER	Surface Water	Iron as Fe	APHA,3500-Fe-B,23rd edition
681	CHEMICAL- WATER	Surface Water	Lead as Pb	APHA,3110-B 23rd edition
682	CHEMICAL- WATER	Surface Water	Nitrate as NO ₃	APHA,4500 -NO ₃ -B,23rd edition
683	CHEMICAL- WATER	Surface Water	Oil & Grease	IS 3025(Part-39)1991:
684	CHEMICAL- WATER	Surface Water	pH	IS 3025(Part-11)
685	CHEMICAL- WATER	Surface Water	Phenolic Compounds (as C ₆ H ₅ OH)	APHA,5530-B-C&E ,23rd edition
686	CHEMICAL- WATER	Surface Water	Sulphate as SO ₄	IS 3025(Part-24)
687	CHEMICAL- WATER	Surface Water	Total Dissolved Solids (TDS)	IS 3025(Part-16)
688	CHEMICAL- WATER	Surface Water	Zinc as Zn	APHA,3110-B 23rd edition
689	CHEMICAL- WATER	Swimming Pool Water	Alkalinity as CaCO ₃ (Phenolphthalein & Total	IS 3025 (Part-23)
690	CHEMICAL- WATER	Swimming Pool Water	Aluminium as Al	IS 3025 (Part -55)
691	CHEMICAL- WATER	Swimming Pool Water	Chloride (as Cl)	IS 3025 (Part -32)
692	CHEMICAL- WATER	Swimming Pool Water	Colour	APHA, 2120- B, 23rd edition
693	CHEMICAL- WATER	Swimming Pool Water	Iron as Fe	3500-Fe-B,APHA 23rd Edition
694	CHEMICAL- WATER	Swimming Pool Water	Lead as Pb	APHA,3110-B,23rd edition
695	CHEMICAL- WATER	Swimming Pool Water	Odour	IS 3025 (Part-5)
696	CHEMICAL- WATER	Swimming Pool Water	Oxygen Absorbed in 4 hours at 27 deg. C.	IS 3025 (Part -63)
697	CHEMICAL- WATER	Swimming Pool Water	pH	IS 3025 (Part -11)
698	CHEMICAL- WATER	Swimming Pool Water	Residual Free Chlorine as Cl ₂	IS 3025 (Part- 26)



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S.No	Discipline / Group	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of tests performed	Test Method Specification against which tests are performed and / or the techniques / equipment used
699	CHEMICAL- WATER	Swimming Pool Water	Total Dissolved Solids (TDS)	IS 3025 (Part -16)
700	CHEMICAL- WATER	Swimming Pool Water	Turbidity	IS 3025 (Part -10)

NOTE- The Laboratory has demonstrated competence for the stated scope for WATER. This however does not fully cover the specification requirements of BIS for the Packaged Drinking Water as per IS 14543 and the Packaged Natural Mineral Water IS 13428.





Date: 12/12/2022

DECLARATION LETTER

TO WHOMSOEVER IT MAY CONCERN

Subject: Regarding extension of our NABL accreditation validity.

Respected Sir/Madam,

With reference to above mentioned subject, this is to inform you that our NABL accreditation via certificate no. **TC-8932** having validity i.e. from **14/08/2020 to 15/07/2022** has been further extended to **15/01/2023** via email communication received from NABL dated **12/12/2022**, where it states that "validity of accreditation for the certificate number **TC-8932** valid from **14.08.2020- 15.07.2022**, has been further extended for the existing scope of accreditation up to one month (**15.01.23**) or till the decision on renewal of accreditation is taken, whichever is earlier for the existing scope".

According to the mail received, we hereby declare that we shall continue our services as NABL accredited laboratory till **15/01/2023** for accreditation certificate no. **TC-8932** for **Chemical and Biological discipline for the existing scope**.

This is for your kind information.

With Best Regards,
For Shree Krishna Analytical Services Pvt. Ltd.


Rajesh Yadav
Director

Encl:

1. NABL certificate TC-8932
2. Email received from NABL for validity extension

Regarding Renewal of our NABL accreditation valid upto 15.11.2022

iti iti <iti@nabl.qcin.org>

12 December 2022 at 16:19

To: Info Ska <info@skaslab.com>

Cc: Neeta Pathak <neetapathak@skaslab.com>

Dear Sir,

This is in reference to the application for renewal of accreditation for the laboratory "Shree Krishna Analytical Services Pvt. Ltd., New Delhi T-5108" submitted on 17.05.22.

We are pleased to inform you that validity of accreditation for the certificate number TC-8932 valid from 14.08.2020- 15.07.2022, has been further extended for the existing scope of accreditation up to one month (15.01.23) or till the decision on renewal of accreditation is taken, whichever is earlier.

Please note that being an accredited laboratory of NABL you must fulfill all the Terms and Conditions laid down in NABL-131 and NABL 133.

*Sincerely,**Iti Saxena,**Dy. Director, NABL,**Quality Council of India**Plot No.45, Sector 44,**Gurgaon-122003 (Haryana)**Ph : +91 1244679724**NABL Website: www.nabl-india.org*

From: iti iti <iti@nabl.qcin.org>**Sent:** Wednesday, November 16, 2022 9:32 AM**To:** Info Ska <info@skaslab.com>**Cc:** Nitangarg <nitangarg@nabl.qcin.org>; Neeta Pathak <neetapathak@skaslab.com>; anuja anuja <anuja@nabl.qcin.org>

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National Accreditation Board for
Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

SHREE KRISHNA ANALYTICAL SERVICES PVT. LTD.

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

**"General Requirements for the Competence of Testing &
Calibration Laboratories"**

for its facilities at

A-5/4, MAYAPURI INDUSTRIAL AREA, PHASE-II, NEW DELHI, DELHI, INDIA

in the field of

TESTING

Certificate Number: TC-8932

Issue Date: 14/08/2020

Valid Until: 15/07/2022

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : SHREE KRISHNA ANALYTICAL SERVICES PVT. LTD.

Signed for and on behalf of NABL



N. Venkateswaran
Chief Executive Officer

