Four laning of Kothi – Satna - Mahiar Section of NH 135BG from km 55.000 to km 76.960 (Package-II) and km 80.800 to km 119.535 (Package-III) under Bharatmala Pariyojana in the State of Madhya Pradesh

DRAFT TERMS OF REFERENCE FOR EIA STUDY

Study Area: Primary baseline data will be collected within the right of way as well as the area falling within 500 meters on either side of the proposed right of way and secondary data such as protected areas notified under wildlife (protection) Act 1972, Critically Polluted Areas as notified by Central Pollution Control Board, notified Eco-sensitive areas, interstate boundaries and international boundaries, water bodies of ecological significance, etc. will be collected within 15 km aerial distance as per EIA Notification 2006.

Draft Terms of Reference of the EIA Study is presented below:

1. A brief description of the project, project name, nature, size, its importance to the region / state and the country

2. 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

3. Detailed alignment plan, with details such as nature of terrain (plain, rolling, hilly), land use pattern, habitation, cropping pattern, forest area, environmentally sensitive places, mangroves, notified industrial areas, sand dunes, sea, river, lake, details of villages, teshils, 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.

4. Description of various alternatives considered, procedures and criteria adopted for selection of the final alternative with reasons

5. 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. and a detailed ground surveyed map on 1:2000 scale showing the existing features falling within the right of way namely trees, structures including archeological & religious, monuments etc. if any.

6. Study regarding the Animal bypasses / underpasses etc. across the habitation areas will be carried out. Adequate cattle passes for the movement of agriculture material will be provided at the stretches passing through habitation areas.

7. 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; details of compensatory plantation and possibilities of relocating the existing trees; animal and wild life crossings to be provided in areas inhabited by wild life.

8. Necessary green belt will be provided on both sides of the highway with proper central verge and cost provision should be made for regular maintenance.

9. Details of wayside amenities, including petrol station /service centre, rest areas, public conveyance etc. Noice reduction measures to be indicated

10. Details of the proposed bridges, the design and traffic circulation at this junction with simulation studies.

11. Details about measures taken for the pedestrian safety and construction of underpasses and foot-over bridges along with flyovers and interchanges

12. 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

13. Details of sand quarry, borrow area and rehabilitation.

14. Possibilities of utilizing the debris/ waste materials available in and around the project area

15. Details on compliance with respect to "Research and Test (ResT) reaches along National Highways" Notification of MoRTH dated 12th December 2012

16. 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 March 19, 2013.

17. Climate and meteorology (max and min temperature, relative humidity, rainfall, frequency of tropical cyclone and snow fall); the nearest IMD meteorological station

18. Baseline environmental monitoring of for **ONE SEASON**

Attributes	**Parameters**	**Frequency**	**No. of Locations**
Meteorology	Hourly Wind Speed, Wind Direction, Relative Humidity, Temperature & Rainfall	Hourly data	1
Ambient Air Quality	PM_{10}, $PM_{2.5}$, SO_2, NO_X & CO	Twice a Week for one season	5
Ambient Noise Quality	Hourly Leq, Leq (Day), Leq (Night) and Mean Noise Level in dB(A)	24 hourly, once during the study period	5
Soil Quality	Soil texture (sand, silt, and clay), Soil Type, pH, Electrical Conductivity, Moisture Content (%), Infiltration Rate (mm/hr), Organic Matter , Bulk Density, Porosity, Nitrogen, Potassium, phosphorus, Chlorides, Sodium, Sodium Absorption Ratio (SAR), Sodium Sulphate, Calcium Sulphate, Pb, Fe	once during the study period	2
Surface Water Quality	pH (at 25°C), Temperature, Electrical Conductivity, Colour, Turbidity, Total Hardness as $CaCO_3$, TDS, TSS, Na, K, Ca, Mg, DO, BOD, COD, Chloride as Cl,	once during the study period	4

Attributes	Parameters	Frequency	No. of Locations
	Sulphate SO_4, TKN, Nitrate as NO_3, Fe, Mn, Cd, As, Cr, Cu, Hg, Pb, Zn, B, F, Chlorine, Phenolic Compounds, Surfactants, Phosphate as PO4, Sodium Absorption Ratio (SAR), Total Coliforms (MPN/100 ml), Faecal Coliforms		
Ground Water Quality	pH, Temperature, Electrical Conductivity, Turbidity, Total Hardness as $CaCO_3$, Total Alkalinity as $CaCO_3$, TDS, Na, K, Ca, Mg, Chloride as Cl, Sulphate SO_4, Nitrate as NO_3, Fe, Mn, Cd, As, Cr, Cu, Hg, Pb, Zn, B, F, Total Coliforms	once during the study period	4

19. Identification of project activities during construction and operation phases, which will affect the noise levels and the potential for increased noise resulting from this project; effect of noise levels on near-by habitation during the construction and operational phases of the proposed highway; noise reduction measures and traffic management strategies for reducing the negative impact if any; prediction of noise levels will be done by using mathematical modeling at different representative locations.

20. 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

21. Details about the protection to existing habitations from dust, noise, odour etc. during construction stag; IRC guidelines to be followed for traffic safety while passing through the habitat

22. 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 site along with necessary permission.

23. Details of water bodies including the seasonal ones within the corridor of impacts along with their status, volumetric capacity, quality likely impacts on them due to the project

24. Details of water quantity required and source of water including water requirement during the construction stage with supporting data and also categorization of ground water based on the CGWB classification

25. Details of measures taken during constructions of bridges across canal/major or minor drains keeping in view the flooding and the life span of the existing bridges; provision of speed breakers, safety signals, service lanes and foot paths at appropriate locations throughout the proposed expressway to avoid the accidents

26. If there is any change in the drainage pattern after the proposed activity, details of changes will be examined and submitted.

27. Rain water harvesting pit will be at least 3 - 5 m. above the highest ground water table. Provision will be made for oil and grease removal from surface runoff

28. Details of road safety, signage, service roads, vehicular under passes, accident prone zone and the mitigation measures

29. Social Impact Assessment due to the proposed construction of greenfield expressway

30. Details of the properties, houses, businesses religious and social places etc. activities likely to be effected by land acquisition and their financial loses annually.

31. 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 project specific schedule of the implementation

32. 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.

33. Details of Corporate Social Responsibility and necessary provisions in the budget

34. Estimated cost of the project including environmental monitoring cost and funding agencies, whether governmental and details of budget provisions (capital & recurring) for the project specific R&R Plan

35. Environmental Management and Monitoring Plan for all phases of the project viz. construction and operation

36. Environmental **Management Plan** covering following aspects:

- ✓ Preventive, mitigation & enhancement measures for minimization & abatement of the undesirable impacts caused during the construction and operation stage.
- ✓ Green belt development plan
- ✓ Environmental monitoring program during construction and operation phase including parameters, locations and frequency of monitoring, monitoring mechanisms, performance indicators, implementation program and cost
- ✓ Solid Waste Management Plan
- ✓ Borrow Area Management Plan
- ✓ Quarry Area Management Plan
- ✓ Soil Erosion and Sediment Control
- ✓ Storage, Handling and Emergency Response for Hazardous Chemicals
- ✓ Traffic Control and Road Safety Plan during construction
- ✓ Guidelines for Siting, Management and Redevelopment of Construction Camp
- ✓ Guidelines for Management of Debris Disposal Site

- ✓ Guidelines to ensure Worker's Safety during Construction
- ✓ Schematic Plan of Rain Water harvesting Pit
- ✓ Formats for Environmental Monitoring
- ✓ Reporting Format for Identification of Borrow Areas
- ✓ Reporting Format for Identification of Temporary Acquisition of Land
- ✓ Reporting Format for Identification of Site Identification and setting up of Workers Camp, Hot Mix Plant
- ✓ Reporting Format for Dust Suppression at Hot Mix Plants, WMM, Construction Plants, Borrow Area Sites and Crusher Sites
- ✓ Identified / recommended Institutional Set Up for implementation of the EMP including Institutional Requirements, Staffing and Training
- ✓ Expenditures & Budget for Environmental Protection Measures and Implementation of the EMP.

37. Public Hearing as per the provisions of the EIA Notification 2006 and it's subsequent amendments.

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