



**REPUBLIC OF INDIA**  
**GOVERNMENT OF MAHARASHTRA**  
**RURAL DEVELOPMENT DEPARTMENT**

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**MUKHYA MANTRI GRAM SADAK YOJANA (MMGSY)**  
**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANNING FRAMEWORK**  
**(ESMPF) - DRAFT**

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**Project ID: P001120**

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**ANNEXURES (ESMPF)**

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**Prepared by**

Maharashtra Rural Road Development Association, Government of Maharashtra

**For**

Asian Infrastructure Investment Bank (AIIB)

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**SEP 2026**

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**List of Acronyms**

|                  |   |                                                      |
|------------------|---|------------------------------------------------------|
| <b>AIIB</b>      | : | Asian Infrastructure Investment Bank                 |
| <b>BAMP</b>      | : | Borrow Area Management Plan                          |
| <b>BOQ</b>       | : | Bill of Quantities                                   |
| <b>BPL</b>       | : | Below Poverty Line                                   |
| <b>C &amp; D</b> | : | Construction and Demolition                          |
| <b>CEA</b>       | : | Civil Engineering Assistant                          |
| <b>CPCB</b>      | : | Central Pollution Control Board                      |
| <b>CRN</b>       | : | Core Road Network                                    |
| <b>CTE</b>       | : | Consent to Establish                                 |
| <b>CTO</b>       | : | Consent to Operate                                   |
| <b>dB</b>        | : | Decibels                                             |
| <b>EA</b>        | : | Executing Agency                                     |
| <b>EAP</b>       | : | Externally Aided Projects                            |
| <b>EC</b>        | : | Environment Clearance                                |
| <b>EHS</b>       | : | Environment Health and Safety                        |
| <b>EIA</b>       | : | Environment Impact Assessment                        |
| <b>EMOP</b>      | : | Environment Monitoring Plan                          |
| <b>ESEL</b>      | : | Environment and Social Exclusion List                |
| <b>ESF</b>       | : | Environment and Social Framework                     |
| <b>ESMP</b>      | : | Environment and Social Management Plan               |
| <b>ESMPF</b>     | : | Environment and Social Management Planning Framework |
| <b>ESP</b>       | : | Environment and Social Policy                        |
| <b>ESS</b>       | : | Environment and Social Standards                     |
| <b>FGD</b>       | : | Focus Group Discussion                               |
| <b>FPIC</b>      | : | Free, Prior, and Informed Consent                    |
| <b>GAP</b>       | : | Gender Action Plan                                   |
| <b>GBV</b>       | : | Gender Based Violence                                |

|                    |   |                                                   |
|--------------------|---|---------------------------------------------------|
| <b>GDP</b>         | : | Gross Domestic Product                            |
| <b>GESI</b>        | : | Gender Equality and Social Inclusion              |
| <b>GGBS</b>        | : | Ground Granulated Blast Furnace Slag              |
| <b>GHG</b>         | : | Green House Gas                                   |
| <b>GoM</b>         | : | Government of Maharashtra                         |
| <b>GRC</b>         | : | Grievance Redressal Cell                          |
| <b>GRM</b>         | : | Grievance Redressal Mechanism                     |
| <b>ICAR</b>        | : | Indian Council for Agricultural Research          |
| <b>IPP</b>         | : | Indigenous Peoples Plan                           |
| <b>IPPF</b>        | : | Indigenous Peoples Planning Framework             |
| <b>IRC</b>         | : | Indian Roads Congress                             |
| <b>IS</b>          | : | Indian Standard                                   |
| <b>km</b>          | : | kilometer                                         |
| <b>LAP</b>         | : | Land Acquisition Plan                             |
| <b>LARP</b>        | : | Land Acquisition and Resettlement Plan            |
| <b>LCMP</b>        | : | Labour Camp Management Plan                       |
| <b>MAHA RUP</b>    | : | Maharashtra Road Upgradation Program              |
| <b>MDRs</b>        | : | Major District Roads                              |
| <b>MITRA</b>       | : | Maharashtra Institution for Transformation        |
| <b>MoEF&amp;CC</b> | : | Ministry of Environment Forest and Climate Change |
| <b>MoRTH</b>       | : | Ministry of Road Transport and Highways           |
| <b>MOU</b>         | : | Memorandum of Understanding                       |
| <b>MPCB</b>        | : | Maharashtra Pollution Control Board               |
| <b>MRRDA</b>       | : | Maharashtra Rural Road Development Association    |
| <b>NAAQS</b>       | : | National Ambient Air Quality Standards            |
| <b>NHAI</b>        | : | National Highways Authority of India              |
| <b>NOC</b>         | : | No Objection Certificate                          |
| <b>OCHSP</b>       | : | Occupational and Community Health and Safety Plan |
| <b>PAP</b>         | : | Project Affected Persons/People                   |
| <b>PD</b>          | : | Project Director                                  |

ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

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|                 |   |                                                                                                      |
|-----------------|---|------------------------------------------------------------------------------------------------------|
| <b>PIU</b>      | : | Project Implementation unit                                                                          |
| <b>PMU</b>      | : | Project Management Unit                                                                              |
| <b>PPE</b>      | : | Personal Protective Equipment                                                                        |
| <b>PPM</b>      | : | Project-Affected People's Mechanism                                                                  |
| <b>QSMP</b>     | : | Quarry Area Management Plan                                                                          |
| <b>RFCTLARR</b> | : | Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act |
| <b>RoW</b>      | : | Right of Way                                                                                         |
| <b>SC</b>       | : | Scheduled Caste                                                                                      |
| <b>SEIAA</b>    | : | State Environment Impact Assessment Authority                                                        |
| <b>SH</b>       | : | Sexual Harassment                                                                                    |
| <b>SHs</b>      | : | State Highways                                                                                       |
| <b>SIA</b>      | : | Social Impact Assessment                                                                             |
| <b>ST</b>       | : | Scheduled Tribes                                                                                     |

**ANNEXURE 1: POLICY AND LEGAL FRAMEWORK (NATIONAL & STATE)**

| <b>Sr. No.</b> | <b>Name of the Laws, Policies and Rules</b>                                        | <b>Mandate of the Act/ Policy</b>                                                                                     | <b>Relevance to the Project</b>                                                                                                                                                                                        |
|----------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.             | Environment (Protection) Act, 1986                                                 | Umbrella legislation for protection and improvement of environmental quality and prevention and control of pollution. | Yes. Applicable for overall environmental management and compliance during planning, construction, and operation of the project.                                                                                       |
| 2.             | Environmental Impact Assessment (EIA) Notification, 2006 and subsequent amendments | Provides environmental clearance requirements for specified development projects.                                     | Not Applicable                                                                                                                                                                                                         |
| 3.             | Water (Prevention and Control of Pollution) Act, 1974                              | Provides measures for prevention and control of water pollution and maintenance of water quality.                     | Yes. Relevant for management of water and wastewater, runoff, labour camps, construction plants, and protection of nearby water bodies and required statutory permission for CTE and CTO of crusher and Batching plant |
| 4.             | Air (Prevention and Control of Pollution) Act, 1981                                | Provides measures for prevention and control of air pollution.                                                        | Yes. Applicable for management of ppm, dust and ambient air quality and emissions from construction activities, vehicles, and plant to avoid negative impact on human health, plants & vegetations, etc.               |
| 5.             | Noise Pollution (Regulation and Control) Rules, 2000                               | Regulates ambient noise standards for different land use zones.                                                       | Yes. Applicable for management of construction noise and protection of sensitive receptors along project corridors and ensuring the standards led by CPCB within the permissible range.                                |
| 6.             | Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980                                   | For the necessary tree cutting permission within the project proposed alignment.                                      | May be conditional. Applicable where forest land diversion, protected forest areas along the RoW, or statutory forest clearance requirements are identified during DPR preparation.                                    |
| 7.             | Indian Forest Act, 1927 and State Tree Cutting Rules                               | Regulates protection and felling of trees.                                                                            | Yes. Applicable for obtaining tree cutting permissions and                                                                                                                                                             |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Sr. No. | Name of the Laws, Policies and Rules                                           | Mandate of the Act/ Policy                                                            | Relevance to the Project                                                                                                                                                                                        |
|---------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |                                                                                |                                                                                       | compensatory plantation requirements.                                                                                                                                                                           |
| 8.      | Wildlife (Protection) Act, 1972                                                | Provides protection to wildlife habitats, protected areas, and wildlife species.      | May be conditional. Applicable where protected areas, eco-sensitive zones, wildlife habitats/corridors, or other wildlife-sensitive areas are identified during DPR preparation.                                |
| 9.      | Biological Diversity Act, 2002                                                 | Provides for conservation and sustainable use of biodiversity.                        | May be conditional. Applicable where areas of significant biodiversity value, critical habitats, ecologically sensitive areas, or other biodiversity-sensitive receptors are identified during DPR preparation. |
| 10.     | Wetlands (Conservation and Management) Rules, 2017                             | Provides framework for conservation and management of notified wetlands.              | May be conditional. Applicable where notified/protected wetlands or other wetland areas are identified within or adjacent to the project influence area during DPR preparation                                  |
| 11.     | Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 | Regulates handling, storage, transportation, and disposal of hazardous waste.         | Yes. Applicable for management of used oil, fuel, lubricants, chemicals, bituminous waste, Admixtures and hazardous materials during construction.                                                              |
| 12.     | Solid Waste Management Rules, 2016                                             | Establishes framework for scientific management of solid waste.                       | Yes. Applicable for management of solid waste generated from labour camps and project activities. (i.e., sanitary land fillings, pyrolysis, incineration, etc.)                                                 |
| 13.     | Construction and Demolition Waste Management Rules, 2016                       | Provides procedures for management and disposal of construction and demolition waste. | Yes. Applicable to all construction and demolition activities under the project.                                                                                                                                |
| 14.     | Fly Ash Notification, 2016 and subsequent amendments                           | Promotes utilization of fly ash in construction activities.                           | Yes. As per MoRTH guidelines the projects falling within 300 km of thermal power plant are mandated to use fly ash in construction material for soil                                                            |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Sr. No. | Name of the Laws, Policies and Rules                                                                                      | Mandate of the Act/ Policy                                                                                                   | Relevance to the Project                                                                                                                      |
|---------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
|         |                                                                                                                           |                                                                                                                              | stabilization of subgrade of road pavement.                                                                                                   |
| 15.     | Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Rules, 1959                                          | Provides protection to ancient monuments, archaeological sites, and cultural heritage resources.                             | Conditional. Applicable if protected monuments or archaeological sites fall within the project influence area.                                |
| 16.     | Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996                    | Provides safety, health, and welfare measures for construction workers.                                                      | Yes. Applicable for labour management, worker safety, and welfare during construction.                                                        |
| 17.     | Motor Vehicles Act, 1988                                                                                                  | Regulates road transport and traffic safety measures.                                                                        | Yes. Relevant for traffic management, transportation safety, and road safety planning and identification of black spots.                      |
| 18.     | Energy Conservation Act, 2001                                                                                             | Promotes efficient use and conservation of energy.                                                                           | Yes. Encourages energy-efficient technologies and sustainable infrastructure practices.                                                       |
| 19.     | National Action Plan on Climate Change (NAPCC)                                                                            | Provides national strategy for climate change adaptation and mitigation.                                                     | Yes. Relevant considering the climate-resilient infrastructure focus of the project.                                                          |
| 20.     | Relevant MoRTH, IRC, CPCB, MPCB and Government of Maharashtra Guidelines                                                  | Provide technical and environmental guidelines for road development and environmental management.                            | Yes. Applicable for design standards, construction practices, environmental safeguards, drainage, and road safety measures under the project. |
| 21.     | Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR Act) | Governs land acquisition, compensation, rehabilitation, and resettlement of affected persons.                                | No. Not Applicable as such stretches where land acquisition is required will be excluded from the project.                                    |
| 22.     | The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006                       | Recognizes and vests forest rights and occupation rights in forest land to Scheduled Tribes and traditional forest dwellers. | Conditional. Applicable if project activities involve forest land or affect forest-dwelling communities.                                      |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Sr. No. | Name of the Laws, Policies and Rules                                                      | Mandate of the Act/ Policy                                                                             | Relevance to the Project                                                                                                                         |
|---------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 23.     | Panchayats Extension to Scheduled Areas (PESA) Act, 1996                                  | Provides for self-governance through Gram Sabhas in Scheduled Areas.                                   | Conditional. Applicable if any project corridor falls within Scheduled Areas.                                                                    |
| 24.     | Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989 and amendments | Prevents discrimination and atrocities against Scheduled Castes and Scheduled Tribes.                  | Yes. Applicable during stakeholder engagement, labour management, and project implementation activities.                                         |
| 25.     | Right to Information Act, 2005                                                            | Promotes transparency and accountability in public authorities.                                        | Yes. Applicable for disclosure of project information and transparency during implementation.                                                    |
| 26.     | Child and Adolescent Labour (Prohibition and Regulation) Act, 1986 and amendments         | Prohibits employment of children and regulates employment conditions for adolescents.                  | Yes. Applicable during construction activities and labour management.                                                                            |
| 27.     | Bonded Labour System (Abolition) Act, 1976                                                | Abolishes bonded labour system and protects labour rights.                                             | Yes. Applicable for ensuring fair labour practices during project implementation.                                                                |
| 28.     | Code on Wages, 2019                                                                       | Consolidates laws relating to wages, bonus, and equal remuneration for workers.                        | Yes. Applicable for ensuring fair wages, non-discrimination, and labour welfare during construction activities.                                  |
| 29.     | Occupational Safety, Health and Working Conditions Code, 2020                             | Consolidates laws relating to occupational safety, health, welfare, and working conditions of workers. | Yes. Applicable for worker safety, labour camp management, occupational health, and welfare measures during project implementation.              |
| 30.     | Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 | Provides protection against sexual harassment at workplace.                                            | Yes. Applicable for ensuring safe and gender-sensitive work environment during project implementation.                                           |
| 31.     | Rights of Persons with Disabilities Act, 2016                                             | Protects rights and accessibility of persons with disabilities.                                        | Yes. Relevant for incorporation of inclusive and accessible infrastructure measures.                                                             |
| 32.     | Motor Vehicles Act, 1988 and subsequent amendments                                        | Regulates road transport, traffic management, and road safety measures.                                | Yes. Relevant for traffic safety, construction zone management, road user safety and identification of black spots as per subsequent amendments. |
| 33.     | Street Vendors (Protection of Livelihood and                                              | Protects rights and livelihoods of street vendors.                                                     | Conditional. Applicable where roadside commercial activities or vendors may be temporarily                                                       |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| <b>Sr. No.</b> | <b>Name of the Laws, Policies and Rules</b>                          | <b>Mandate of the Act/ Policy</b>                                            | <b>Relevance to the Project</b>                                                                                   |
|----------------|----------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|                | Regulation of Street Vending) Act, 2014                              |                                                                              | affected due to project interventions.                                                                            |
| 34.            | National Policy on Safety, Health and Environment at Workplace, 2009 | Promotes safe and healthy working environment across sectors.                | Yes. Relevant for occupational health and safety management during construction activities.                       |
| 35.            | National Rehabilitation and Resettlement Policy, 2007                | Provides framework for rehabilitation and resettlement of affected families. | No, not applicable as such stretches will be excluded from the project at the time of initial screenings of DPRs. |

## ANNEXURE 2: COMPARISON OF AIIB ESF AND NATIONAL/STATE LEGISLATION

| Sr. No. | AIIB Environmental and Social Standard (ESS)                     | Equivalent National and State Environmental & Social Policy and Regulations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Policy Gaps vs AIIB ESS and Gap Filling / Redressal Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.      | <b>ESS 1: Environmental and Social Assessment and Management</b> | Environment (Protection) Act, 1986; EIA Notification, 2006; Water Act, 1974; Air Act, 1981; Noise Pollution Rules, 2000; Solid Waste Management Rules, 2016; Hazardous and Other Wastes Rules, 2016; Forest (Conservation) Act, 1980; Wildlife (Protection) Act, 1972; Disaster Management Act, 2005; Occupational Safety, Health and Working Conditions Code, 2020; Right to Information Act, 2005; Maharashtra felling of trees (Regulation) Act, 1964; Maharashtra State Disaster Management Plan, 2016; Maharashtra State Action Plan on Climate Change, 2014. | National regulations primarily focus on statutory compliance and sector-specific requirements. AIIB ESS 1 requires a comprehensive assessment of environmental and social risks and impacts, including stakeholder engagement, biodiversity considerations, labour and working conditions, occupational and community health and safety, climate change, disaster risk, cumulative impacts, monitoring, and lifecycle management. These gaps shall be addressed through implementation of the ESMPE, environmental and social screening, preparation of project-specific safeguard instruments, stakeholder consultations, grievance redress mechanisms, environmental and social monitoring, and adoption of good international industry practices. |
| 2.      | <b>ESS 2: Involuntary Resettlement</b>                           | Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCTLARR), 2013; Maharashtra Direct Purchase Policy, 2016.                                                                                                                                                                                                                                                                                                                                                                                                   | Not Applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 3.      | <b>ESS 3: Indigenous Peoples</b> <i>(if applicable)</i>          | Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; Panchayats Extension to Scheduled Areas (PESA) Act, 1996                                                                                                                                                                                                                                                                                                                                                                                                          | National legislation provides protection of the rights of Scheduled Tribes and traditional forest dwellers. AIIB ESS 3 requires culturally appropriate engagement, assessment of project impacts on Indigenous Peoples, and measures to ensure that affected communities                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

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|  |  |  |                                                                                                                                                                                                                                                                               |
|--|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |  | receive culturally compatible benefits and avoid adverse impacts. Where Indigenous Peoples are present in project influence areas, the requirements of ESS 3 shall be addressed through project-specific assessments and planning measures consistent with AIIB requirements. |
|--|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**ANNEXURE 3: APPLICABLE STATUTORY PERMITS**

| <b>Sl. No.</b> | <b>Applicable Permit / Approval</b>                                          | <b>Competent Authority</b>                                                                                 | <b>Applicable Act / Rules</b>                                                                                   | <b>Stage / Time of Compliance</b>                                |
|----------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1.             | Environmental Clearance (EC), if applicable                                  | MoEF&CC / SEIAA                                                                                            | EIA Notification, 2006 under Environment (Protection) Act, 1986                                                 | Not Applicable                                                   |
| 2.             | Wildlife Clearance, if applicable                                            | State Wildlife Board / National Board for Wildlife (NBWL) / MoEF&CC                                        | Wildlife (Protection) Act, 1972                                                                                 | During project planning and prior to commencement of works       |
| 3.             | Forest Clearance, if applicable                                              | State Forest Department / MoEF&CC                                                                          | Forest (Conservation) Act, 1980 and Rules thereunder                                                            | Prior to diversion/use of forest land                            |
| 4.             | Tree Cutting Permission                                                      | Divisional Forest Officer (DFO) / Tree Authority / Local Authority                                         | Applicable State Tree Preservation Act and Forest Regulations                                                   | Prior to cutting or transplantation of trees                     |
| 5.             | Quarry Permit / Mining Lease for Borrow Area, Quarry Material and Aggregates | Department of Geology & Mining, State Pollution Control Board, Revenue Department, District Administration | Mines and Minerals (Development and Regulation) Act, 1957; Environmental Regulations; State Minor Mineral Rules | Prior to operation of quarry/borrow area and material extraction |
| 6.             | Explosive Storage and Use License (if blasting is involved)                  | Petroleum and Explosives Safety Organisation (PESO)                                                        | Explosives Act, 1884 and Explosives Rules, 2008                                                                 | Prior to procurement, storage and use of explosives              |
| 7.             | Crusher Plant Establishment Approval                                         | State Pollution Control Board and Local Authority                                                          | Air (Prevention and Control of Pollution) Act, 1981; Environment (Protection) Act, 1986                         | Prior to installation of crusher plant                           |
| 8.             | Permission for Construction Camp                                             | Gram Panchayat / Local Authority                                                                           | Applicable Panchayat Rules and Local Authority Regulations                                                      | Prior to establishment of labour/construction camp               |
| 9.             | Consent to Establish (CTE) for Crusher Plant                                 | State Pollution Control Board                                                                              | Water Act, 1974 and Air Act, 1981                                                                               | Before installation and commencement of plant construction       |
| 10.            | Consent to Operate (CTO) for Crusher Plant                                   | State Pollution Control Board                                                                              | Water Act, 1974 and Air Act, 1981                                                                               | Before operation of crusher plant                                |
| 11.            | Batching Plant Approval                                                      | State Pollution Control Board and Local Authority                                                          | Air Act, 1981; Environment (Protection) Act, 1986                                                               | Prior to installation of batching plant                          |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

|     |                                                                                                         |                                                                                           |                                                                                                                                                                   |                                                                                  |
|-----|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| 12. | Consent to Establish (CTE) for Batching Plant                                                           | State Pollution Control Board                                                             | Water Act, 1974 and Air Act, 1981                                                                                                                                 | Before installation of batching plant                                            |
| 13. | Consent to Operate (CTO) for Batching Plant                                                             | State Pollution Control Board                                                             | Water Act, 1974 and Air Act, 1981                                                                                                                                 | Before operation of batching plant                                               |
| 14. | Labour License for Engagement of Local/Migrant Workers                                                  | Labour Department, Government of Maharashtra                                              | Contract Labour (Regulation and Abolition) Act, 1970; Inter-State Migrant Workmen Act, 1979 (where applicable); Building and Other Construction Workers Act, 1996 | Prior to deployment of labour                                                    |
| 15. | Contractor's All Risks (CAR) Insurance Policy                                                           | IRDAI Registered Insurance Company                                                        | Contract Conditions and Applicable Insurance Regulations                                                                                                          | Prior to commencement of works and maintained throughout contract period         |
| 16. | Workers' Compensation Insurance                                                                         | IRDAI Registered Insurance Company                                                        | Employees' Compensation Act, 1923 and Applicable Labour Laws                                                                                                      | Prior to deployment of workforce and maintained throughout contract period       |
| 17. | Permission for Water Abstraction from Pond, River, Canal or Other Surface Water Sources (if applicable) | Gram Panchayat / Irrigation Department / Water Resources Department / Competent Authority | State Water Resource Regulations and Local Authority Requirements                                                                                                 | Prior to withdrawal of water for construction purposes                           |
| 18. | Solid Waste Disposal Permission / Agreement                                                             | Gram Panchayat / Urban Local Body / Authorized Waste Disposal Facility                    | Solid Waste Management Rules, 2016                                                                                                                                | Prior to generation and disposal of waste from camps and construction activities |
| 19. | Authorization for Hazardous and Other Waste Management (if applicable)                                  | State Pollution Control Board                                                             | Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016                                                                                    | Prior to generation, storage, transport or disposal of hazardous waste           |
| 20. | Authorization for Temporary Storage and Disposal of Construction & Demolition Waste (if applicable)     | Local Authority / Urban Local Body                                                        | Construction and Demolition Waste Management Rules, 2016                                                                                                          | Prior to disposal of C&D waste                                                   |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

|     |                                                                                         |                          |                                                                                                        |                                                   |
|-----|-----------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| 21. | Registration of Establishment under BOCW Act                                            | Labour Department        | Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 | Before commencement of construction activities    |
| 22. | Permission for Utility Shifting (Electricity, Water Supply, Telecom, etc.), if required | Concerned Utility Agency | Applicable Utility Regulations and Departmental Procedures                                             | Prior to commencement of utility relocation works |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

**ANNEXURE 4: GENERIC ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)**

| Component                                | Impact                                                                                  | Mitigation Measures                                                                                                                                 | Location                                                                | Responsible Entity                            |            |
|------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------|------------|
|                                          |                                                                                         |                                                                                                                                                     |                                                                         | Implementation                                | Monitoring |
| Pre-construction Phase                   |                                                                                         |                                                                                                                                                     |                                                                         |                                               |            |
| Environmental Screening and Survey       | Disturbance during field surveys                                                        | Restrict survey activities within existing alignment and RoW and avoid damage to vegetation and community property                                  | Entire project corridor                                                 | DPR Consultant                                | PIU/PMU    |
| Baseline Environmental Monitoring        | Inadequate environmental data for impact assessment                                     | Conduct baseline monitoring for air, water, noise and soil.                                                                                         | Representative project locations                                        | DPR Consultant                                | PIU/PMU    |
| Flora and Fauna Study                    | Impact on roadside vegetation, trees, and local biodiversity                            | Conduct flora and fauna assessment; identify sensitive ecological features and recommend mitigation measures                                        | Entire project corridor and sensitive locations                         | DPR Consultant                                | PIU/PMU    |
| Identification of Sensitive Receptors    | Potential impact on schools, hospitals, water bodies, and settlements                   | Prepare detailed inventory of environmentally sensitive receptors for inclusion in mitigation planning                                              | Sensitive locations along project road                                  | DPR Consultant                                | PIU/PMU    |
| Utility Shifting Assessment              | Disturbance to existing utilities and environmental nuisance during shifting activities | Identify and map utilities in advance; Take necessary permission and prepare utility shifting plan to minimize disturbance and environmental damage | Along existing road corridor                                            | DPR Consultant / Concerned Utility Department | PIU/PMU    |
| Drainage Assessment and Provision        | Waterlogging, disruption of natural drainage, and roadside erosion                      | Assess existing drainage pattern and provide adequate roadside drains and cross-drainage structures in design                                       | Low-lying areas, culvert locations, and settlement stretches            | DPR Consultant                                | PIU/PMU    |
| Climate Adaptation Measure Consideration | Increased vulnerability of road infrastructure to flooding, extreme                     | Integrate climate-resilient design measures such as improved drainage, flood protection measures, slope stabilization, erosion control, and         | Flood-prone areas, vulnerable slopes, low-lying stretches, and climate- | DPR Consultant                                | PIU/       |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Component                                          | Impact                                                                   | Mitigation Measures                                                                                                                                                          | Location                                                                                         | Responsible Entity |            |
|----------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------|------------|
|                                                    |                                                                          |                                                                                                                                                                              |                                                                                                  | Implementation     | Monitoring |
|                                                    | rainfall, erosion, and climate-related risks                             | climate-resilient pavement considerations during DPR preparation                                                                                                             | sensitive locations along the project corridor                                                   |                    |            |
| Greenhouse Gas (GHG) Emission Baseline Computation | Lack of baseline data for assessment of project-related carbon emissions | Conduct baseline greenhouse gas emission estimation                                                                                                                          | Entire project corridor                                                                          | DPR Consultant     | PIU        |
| Slope Protection Works                             | Soil erosion, slope instability, and landslide risk                      | Identify vulnerable slope sections and provide suitable slope stabilization and erosion control measures such as retaining structures, turfing, pitching, and toe protection | Embankment areas, cut sections, and vulnerable slopes                                            | DPR Consultant     | PIU/PMU    |
| Surface Water Body Assessment                      | Impact on ponds, streams, and nearby water bodies                        | Identify nearby water bodies and incorporate protection measures in project planning and design                                                                              | Water body crossings and nearby locations                                                        | DPR Consultant     | PIU/PMU    |
| Public Consultation and Information Disclosure     | Community concerns and grievances                                        | Conduct consultations and document environmental concerns and suggestions                                                                                                    | Villages and settlements                                                                         | DPR Consultant     | PIU/PMU    |
| EMP Preparation                                    | Inadequate mitigation planning                                           | Prepare Environmental Management Plan with mitigation and monitoring measures                                                                                                | Entire project corridor                                                                          | DPR Consultant     | PIU/PMU    |
| GRM                                                | Grievances, complaints unattended leading to non compliance              | Establish GRM early on in the project                                                                                                                                        | Prominently display the channels at all project locations, public offices like panchayat offices | PMU/PIU            | PMU/PIU    |
| <b>Construction Stage</b>                          |                                                                          |                                                                                                                                                                              |                                                                                                  |                    |            |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Component                                                                    | Impact                                                                   | Mitigation Measures                                                                                                                                                   | Location                                            | Responsible Entity |                   |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------|-------------------|
|                                                                              |                                                                          |                                                                                                                                                                       |                                                     | Implementation     | Monitoring        |
| Appointment of Environmental Focal Person                                    | Inadequate environmental compliance and monitoring                       | Appoint qualified Environmental Focal Person/Environmental Officer for implementation of EMP and environmental monitoring activities                                  | Contractor's organization and project site          | Contractor         | PMU/PIU/CSSC      |
| Preparation of Contractor's Environmental and Social Management Plan (CESMP) | Improper implementation of environmental safeguards                      | Prepare and implement Site-Specific ESMP prior to commencement of construction activities                                                                             | Entire project corridor                             | Contractor         | PMU/PIU/CSSC      |
| EMP Training and Capacity Building                                           | Lack of awareness regarding environmental safeguards                     | Conduct regular EMP, OHS, waste management, and environmental awareness training for workers and staff                                                                | Construction camps and work sites                   | Contractor         | PMU/PIU/CSSC      |
| Siting Criteria for Construction and Labour Camp                             | Water pollution, sanitation issues, and disturbance to local communities | Establish camps away from settlements, schools, water bodies, and environmentally sensitive areas with adequate sanitation, drainage, and waste management facilities | Camp and labour camp locations                      | Contractor         | PMU/PIU/CSSC      |
| Siting Criteria for Stone Quarry, Crusher and Plant Locations                | Dust, noise, vibration, and ecological disturbance                       | Use approved/licensed quarry, crusher, batching plant, and hot mix plant locations away from settlements and sensitive receptors                                      | Quarry, crusher, and plant locations                | Contractor         | PMU/PIU/CSSC/SPCB |
| Air Quality Management                                                       | Dust and vehicular emissions affecting nearby environment                | Carry out water sprinkling, cover haul vehicles, maintain equipment, and control emissions from plants and machinery                                                  | Construction sites, haul roads, and plant locations | Contractor         | PMU/PIU/CSSC      |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Component                  | Impact                                                   | Mitigation Measures                                                                                               | Location                                                | Responsible Entity |              |
|----------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------|--------------|
|                            |                                                          |                                                                                                                   |                                                         | Implementation     | Monitoring   |
| Water Quality Management   | Surface and groundwater contamination                    | Prevent discharge of untreated wastewater; provide sediment control and proper drainage arrangements              | Construction sites, camps, and nearby water bodies      | Contractor         | PMU/PIU/CSSC |
| Soil Quality Management    | Soil contamination and erosion                           | Prevent oil and fuel spillage; manage excavated materials properly; stabilize exposed soil surfaces               | Construction corridor and storage areas                 | Contractor         | PMU/PIU/CSSC |
| Noise Quality Management   | Noise pollution affecting nearby settlements and workers | Maintain equipment, restrict noisy activities near settlements during sensitive hours, and provide PPE to workers | Villages, schools, hospitals, and work sites            | Contractor         | PMU/PIU/CSSC |
| Land Use Management        | Temporary disturbance and degradation of land            | Restrict activities within approved areas and restore temporary sites after completion of work                    | Camp sites, storage yards, and temporary work areas     | Contractor         | PMU/PIU/CSSC |
| Slope Protection Works     | Soil erosion, slope failure, and embankment instability  | Provide retaining walls, turfing, pitching, toe walls, and erosion control measures at vulnerable locations       | Embankments, cut sections, and vulnerable slopes        | Contractor         | PMU/PIU/CSSC |
| Borrow Area Management     | Land degradation and water stagnation                    | Use approved borrow areas only and rehabilitate borrow areas after completion of material extraction              | Approved borrow areas                                   | Contractor         | PMU/PIU/CSSC |
| Flora and Fauna Protection | Disturbance to roadside vegetation                       | Minimize vegetation clearance and implement tree plantation plan                                                  | Along the roadside areas                                | Contractor         | PMU/PIU/CSSC |
| Drainage Implementation    | Waterlogging and disruption of natural drainage          | Construct and maintain roadside drains and cross-drainage structures as per approved design                       | Culvert locations, low-lying areas, and roadside drains | Contractor         | PMU/PIU/CSSC |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Component                                 | Impact                                                                                                                                                                                                   | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                | Location                                     | Responsible Entity |              |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|--------------|
|                                           |                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                              | Implementation     | Monitoring   |
| Community Health and Safety Management    | Safety risks to nearby communities and road users                                                                                                                                                        | Install barricades, warning signs, traffic diversions, pedestrian access, and public safety information boards                                                                                                                                                                                                                                                                                                                                                     | Villages, schools, junctions, and work zones | Contractor         | PMU/PIU/CSSC |
| Occupational Health and Safety Management | Worker accidents, injuries, and exposure to hazards                                                                                                                                                      | Provide PPE, first aid, emergency response plan, safety training, and safety supervision at site                                                                                                                                                                                                                                                                                                                                                                   | Construction camps and work sites            | Contractor         | PMU/PIU/CSSC |
| Waste Management                          | Improper disposal of construction and domestic waste                                                                                                                                                     | Segregate, collect, transport, and dispose waste at approved disposal locations; prohibit open dumping and burning                                                                                                                                                                                                                                                                                                                                                 | Construction sites, camps, and plant areas   | Contractor         | PMU/PIU/CSSC |
| Traffic Management                        | Increase in traffic due to movement of construction vehicles and machinery. Risk of accidents involving local people, workers and construction vehicles. Night-time accident risk at construction sites. | Prepare a simple Traffic Management Plan. Provide traffic signs, barricades, cones and flagmen at construction locations. Provide speed limits near villages, schools and residential areas. Use trained drivers. Provide reverse alarms and spotters for heavy vehicles. Avoid unnecessary movement of vehicles through populated areas. Provide reflective signs, barricades and adequate lighting at locations where construction continues during night hours. | Construction sites, camps, and plant areas   | Contractor         | PMU/PIU/CSSC |
| Labour Management                         | Accidents and injuries to construction workers.                                                                                                                                                          | Provide helmets, safety shoes, gloves, reflective jackets and other required PPE. Conduct safety training and toolbox meetings. Provide first-aid facilities at the site.                                                                                                                                                                                                                                                                                          | Construction sites, camps, and plant areas   | Contractor         | PMU/PIU/CSSC |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Component  | Impact                                                                                                                                                                                                                                            | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Location                                   | Responsible Entity |              |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------|--------------|
|            |                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                            | Implementation     | Monitoring   |
|            | <p>Poor sanitation and health conditions for workers.</p> <p>Risk of child labour and forced labour.</p> <p>Complaints related to wages, working hours, safety or working conditions.</p> <p>Conflicts between workers and local communities.</p> | <p>Provide safe drinking water, toilets, washing facilities, waste bins and clean working/rest areas. Maintain proper hygiene at labour camps, where provided.</p> <p>Do not employ children or forced labour. Verify the age and identity of workers before employment. Maintain worker records.</p> <p>Provide a simple and confidential Worker Grievance Redress Mechanism (GRM). Inform workers about whom to contact for complaints. Resolve complaints within a defined period.</p> <p>Inform workers about local customs and appropriate behaviour. Prohibit nuisance, harassment, violence and unauthorized activities in nearby villages.</p> |                                            |                    |              |
| GBV/SEA/SH | <p>Risk of gender-based violence, sexual exploitation, abuse and sexual harassment involving workers or community members.</p> <p>Women and vulnerable persons may feel unsafe around construction sites or labour camps.</p>                     | <p>Provide awareness training on GBV, SEA and SH. Clearly communicate that such behaviour is prohibited.</p> <p>Provide adequate lighting and sanitation at labour facilities. Control access to labour camps. Avoid unnecessary interaction between workers and local communities.</p> <p>Provide confidential complaint channels and a designated person for receiving complaints.</p>                                                                                                                                                                                                                                                               | Construction sites, camps, and plant areas | Contractor         | PMU/PIU/CSSC |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Component | Impact                                                                                                                                                                                                                                                                                                                                                                                                  | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Location                                   | Responsible Entity |              |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------|--------------|
|           |                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                            | Implementation     | Monitoring   |
|           | Victims may hesitate to report incidents due to fear or social stigma.<br>Lack of awareness among workers regarding acceptable behaviour.                                                                                                                                                                                                                                                               | Conduct GBV/SEA/SH awareness sessions during worker induction and periodically during construction. Display appropriate awareness information at labour camps and offices.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |                    |              |
| GRM       | Complaints from local people regarding dust, noise, road access, traffic, construction damage and other project issues.<br>Workers may have complaints regarding wages, safety, working conditions, accommodation or harassment.<br>Women, elderly persons and persons with disabilities may face difficulty in accessing the GRM.<br>Lack of proper documentation may result in unresolved complaints. | Establish a project-level GRM. Display contact details at the construction site and public locations. Register, investigate and resolve complaints within a defined timeframe.<br>Establish a separate worker grievance mechanism. Allow workers to submit complaints confidentially without fear of retaliation.<br>Provide simple and accessible complaint channels. Allow verbal complaints and provide information in the local language. Ensure women and vulnerable groups can approach designated personnel safely.<br>Maintain a grievance register showing complaint date, nature of complaint, action taken, responsible person and closure date. Review the register regularly. | Construction sites, camps, and plant areas | Contractor         | PMU/PIU/CSSC |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Component                                            | Impact                                                          | Mitigation Measures                                                                                                         | Location                                                   | Responsible Entity |                   |
|------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--------------------|-------------------|
|                                                      |                                                                 |                                                                                                                             |                                                            | Implementation     | Monitoring        |
| Scarified Bitumen and Construction Debris Management | Soil and water contamination due to improper disposal           | Reuse/recycle scarified bitumen wherever feasible and dispose unusable material at approved locations                       | Road construction and disposal locations                   | Contractor         | PMU/PIU/CSSC      |
| Statutory Permissions and Regulatory Compliance      | Legal non-compliance and environmental violations               | Obtain and maintain all applicable statutory clearances, consents, permits, and licenses before commencement of activities  | Entire project corridor and plant locations                | Contractor         | PMU/PIU/CSSC/SPCB |
| Site Restoration and Rehabilitation                  | Degraded temporary work areas after construction                | Restore camp sites, storage yards, diversion roads, and temporary work areas to original condition after completion of work | Camps, plant sites, borrow areas, and temporary work areas | Contractor         | PMU/PIU/CSSC      |
| <b>Operation and Maintenance Stage</b>               |                                                                 |                                                                                                                             |                                                            |                    |                   |
| Road Maintenance Activities                          | Dust generation, traffic disruption, and environmental nuisance | Carry out periodic road maintenance with proper housekeeping and traffic management measures                                | Entire project stretch                                     | Contractor         | PMU/PIU           |
| Drainage Maintenance                                 | Waterlogging and blockage of natural drainage                   | Regular cleaning and maintenance of roadside drains, culverts, and cross-drainage structures                                | Drainage and culvert locations                             | Contractor         | PMU/PIU           |
| Road Safety Measures                                 | Accident risks to road users and pedestrians                    | Maintain road signage, road markings, crash barriers, and traffic calming measures                                          | Entire project stretch                                     | Contractor         | PMU/PIU           |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Component                                              | Impact                                                              | Mitigation Measures                                                                                                            | Location                                               | Responsible Entity |            |
|--------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------|------------|
|                                                        |                                                                     |                                                                                                                                |                                                        | Implementation     | Monitoring |
| Tree Plantation Survival Monitoring                    | Loss of roadside greenery and plantation failure                    | Maintain minimum 90% survival rate through watering, protection, replacement plantation, and regular monitoring                | Plantation and avenue plantation areas                 | Contractor         | PMU/PIU    |
| Air Quality Monitoring                                 | Deterioration of ambient air quality due to vehicular movement      | Conduct periodic ambient air quality monitoring and implement corrective measures where required                               | Settlements and sensitive receptors along project road | Contractor         | PMU/PIU    |
| Water Quality Monitoring                               | Contamination of nearby water resources                             | Conduct periodic surface and groundwater quality monitoring near sensitive locations                                           | Water bodies and nearby water sources                  | Contractor         | PMU/PIU    |
| Soil Quality Monitoring                                | Soil contamination due to road operation and maintenance activities | Conduct periodic soil quality monitoring and prevent improper disposal of waste and oil spillage                               | Roadside areas and maintenance work sites              | Contractor         | PMU/PIU    |
| Noise Level Monitoring and Noise Barrier Effectiveness | Increase in noise levels affecting nearby communities               | Conduct periodic noise monitoring and maintain effectiveness of noise barriers and plantation buffers near sensitive receptors | Villages, schools, hospitals, and sensitive locations  | Contractor         | PMU/PIU    |
| Waste and Debris Management                            | Improper disposal of maintenance waste and debris                   | Dispose maintenance waste and debris at approved disposal locations and maintain site cleanliness                              | Maintenance work sites                                 | Contractor         | PIU/       |
| Community Grievance Redressal                          | Public complaints and inconvenience during operation stage          | Continue operation of GRM and resolve grievances in timely manner                                                              | Villages and roadside settlements                      | MRRDA              | MRRDA      |
| Site Restoration after Maintenance Work                | Disturbance to roadside environment after repair activities         | Restore temporary maintenance work areas and maintain proper housekeeping after completion of activities                       | Maintenance work areas                                 | Contractor         | PIU/PMU    |

ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

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**ANNEXURE 5: ENVIRONMENT MANAGEMENT PLAN CHECKLIST (for contractor)**

| Sr. No.                                               | Information                                                                                                                    | Yes | No | Remark/<br>Compliance Status |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----|----|------------------------------|
| <b>STATUTORY AND REGULATORY REQUIREMENTS</b>          |                                                                                                                                |     |    |                              |
| 1.                                                    | Environmental Clearance obtained (if applicable)                                                                               |     |    |                              |
| 2.                                                    | Wildlife Clearance obtained (if applicable)                                                                                    |     |    |                              |
| 3.                                                    | Forest Clearance obtained (if applicable)                                                                                      |     |    |                              |
| 4.                                                    | Permission obtained for establishment of construction camps and engagement of labour from local authorities                    |     |    |                              |
| 5.                                                    | Environmental clearance obtained for boulder / stone quarry                                                                    |     |    |                              |
| 6.                                                    | License obtained for storage of explosives, diesel, LPG, flammable liquids, oil, and lubricants under the Explosives Act, 1984 |     |    |                              |
| 7.                                                    | Consent to Establish (CTE) obtained for crusher plant                                                                          |     |    |                              |
| 8.                                                    | Consent to Operate (CTO) obtained for crusher plant                                                                            |     |    |                              |
| 9.                                                    | Consent to Establish (CTE) obtained for batching plant                                                                         |     |    |                              |
| 10.                                                   | Consent to Operate (CTO) obtained for batching plant                                                                           |     |    |                              |
| 11.                                                   | Permission obtained for surface / groundwater extraction                                                                       |     |    |                              |
| 12.                                                   | Tree cutting permission obtained from competent authority                                                                      |     |    |                              |
| 13.                                                   | Permission obtained for solid waste disposal                                                                                   |     |    |                              |
| 14.                                                   | Electrical connection permission obtained                                                                                      |     |    |                              |
| 15.                                                   | Permission obtained for consumer fuel pump (if applicable)                                                                     |     |    |                              |
| 16.                                                   | Valid labour license obtained                                                                                                  |     |    |                              |
| 17.                                                   | Contractor's All Risk (CAR) Insurance Policy obtained                                                                          |     |    |                              |
| 18.                                                   | Employee Compensation Insurance Policy obtained                                                                                |     |    |                              |
| 19.                                                   | Valid Pollution Under Control (PUC) certificates available for all construction vehicles and machinery                         |     |    |                              |
| <b>APPROVAL OF VARIOUS PLANS</b>                      |                                                                                                                                |     |    |                              |
| 20.                                                   | Site-Specific Environmental Management Plan (EMP) prepared and approved                                                        |     |    |                              |
| 21.                                                   | Construction Camp Layout Plan prepared and approved                                                                            |     |    |                              |
| 22.                                                   | Occupational and Community Health and Safety Management Plan approved                                                          |     |    |                              |
| 23.                                                   | Borrow Area Management Plan prepared and approved                                                                              |     |    |                              |
| 24.                                                   | Quarry Area Management Plan prepared and approved                                                                              |     |    |                              |
| 25.                                                   | Tree Plantation and Landscaping Plan approved                                                                                  |     |    |                              |
| 26.                                                   | Traffic Management Plan Prepared and Approved                                                                                  |     |    |                              |
| <b>ENVIRONMENTAL MANAGEMENT AT CONSTRUCTION CAMPS</b> |                                                                                                                                |     |    |                              |
| 27.                                                   | Solar blinker installed at the entry of the construction camp                                                                  |     |    |                              |
| 28.                                                   | Proper barricading provided along the entire periphery of the construction camp                                                |     |    |                              |
| 29.                                                   | Project information board displayed with grievance redressal contact details                                                   |     |    |                              |
| 30.                                                   | Demarcation of functional areas within the camp as per approved layout plan                                                    |     |    |                              |
| 31.                                                   | Approach road to the camp properly maintained                                                                                  |     |    |                              |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Sr. No.                         | Information                                                                                                  | Yes | No | Remark/<br>Compliance Status |
|---------------------------------|--------------------------------------------------------------------------------------------------------------|-----|----|------------------------------|
| 32.                             | Adequate greenery maintained (minimum 30% of camp area)                                                      |     |    |                              |
| 33.                             | Fire extinguisher facilities provided and maintained                                                         |     |    |                              |
| 34.                             | Separate WC facilities provided for male and female workers                                                  |     |    |                              |
| 35.                             | Septic tank / sewage treatment system constructed and maintained                                             |     |    |                              |
| 36.                             | Safe and adequate drinking water facilities provided                                                         |     |    |                              |
| 37.                             | Curing tanks cleaned and maintained regularly                                                                |     |    |                              |
| 38.                             | Proper disposal / reuse of laboratory waste (concrete cubes, debris, etc.)                                   |     |    |                              |
| 39.                             | Surface drainage system maintained to prevent waterlogging                                                   |     |    |                              |
| 40.                             | Restriction on use of plastic for food packaging within the camp                                             |     |    |                              |
| 41.                             | Separate dustbins provided for wet, dry, and sanitary waste                                                  |     |    |                              |
| 42.                             | Oil and grease trap provided at garage and maintenance area                                                  |     |    |                              |
| 43.                             | Paved surface provided at garage and maintenance locations                                                   |     |    |                              |
| 44.                             | Regular maintenance of construction vehicles and equipment                                                   |     |    |                              |
| 45.                             | Designated scrap yard for storage and disposal of waste materials                                            |     |    |                              |
| 46.                             | First-aid facilities provided for workers at camp and work sites                                             |     |    |                              |
| 47.                             | Regular water sprinkling carried out within the camp for dust control                                        |     |    |                              |
| 48.                             | Silt fencing / sediment control measures provided at crusher and batching plant                              |     |    |                              |
| 49.                             | Adequate lighting provided within the camp premises                                                          |     |    |                              |
| 50.                             | Proper housekeeping and cleanliness maintained in camp area                                                  |     |    |                              |
| 51.                             | Designated storage area for hazardous materials with spill control measures                                  |     |    |                              |
| 52.                             | Pest control and sanitation measures implemented regularly                                                   |     |    |                              |
| 53.                             | Display of safety instructions and emergency contact numbers                                                 |     |    |                              |
| 54.                             | Wastewater from kitchen and washing areas properly treated/disposed                                          |     |    |                              |
| 55.                             | Noise control measures implemented in camp and machinery areas                                               |     |    |                              |
| <b>ENVIRONMENTAL MONITORING</b> |                                                                                                              |     |    |                              |
| 56.                             | Timely quarterly environmental monitoring conducted as per contract requirements (Air, Water, Noise & Soil). |     |    |                              |
| 57.                             | Monitoring conducted within prescribed timeline for the respective quarter.                                  |     |    |                              |
| 58.                             | Monitoring carried out at all approved and specified locations.                                              |     |    |                              |
| 59.                             | Consideration of sensitive locations for Noise monitoring (schools, hospitals, residential areas, etc.).     |     |    |                              |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Sr. No.                       | Information                                                                                     | Yes | No | Remark/<br>Compliance Status |
|-------------------------------|-------------------------------------------------------------------------------------------------|-----|----|------------------------------|
| 60.                           | Monitoring conducted through approved/NABL accredited laboratory.                               |     |    |                              |
| 61.                           | Monitoring parameters as per MoEF&CC/CPCB/SPCB norms and agreement conditions.                  |     |    |                              |
| 62.                           | Test results within permissible limits as per applicable standards.                             |     |    |                              |
| 63.                           | Corrective actions initiated in case of exceedance of limits.                                   |     |    |                              |
| 64.                           | Raising request for inspection to Authority/ during monitoring.                                 |     |    |                              |
| 65.                           | Submission of monitoring report including photographs and test results.                         |     |    |                              |
| 66.                           | Monitoring report includes sampling date, time and location details.                            |     |    |                              |
| 67.                           | Report submitted within stipulated time period.                                                 |     |    |                              |
| 68.                           | Environmental monitoring conducted during Construction and Maintenance period as per agreement. |     |    |                              |
| 69.                           | Monitoring records maintained at site for verification.                                         |     |    |                              |
| <b>LABOUR CAMP MANAGEMENT</b> |                                                                                                 |     |    |                              |
| 70.                           | Barricading provided around labour camps                                                        |     |    |                              |
| 71.                           | Working hours displayed and maintained as per labour laws                                       |     |    |                              |
| 72.                           | Employment preference given to local labour                                                     |     |    |                              |
| 73.                           | Medical care facilities available at camp                                                       |     |    |                              |
| 74.                           | Safe and potable drinking water provided                                                        |     |    |                              |
| 75.                           | Separate bathing facilities provided for male and female workers                                |     |    |                              |
| 76.                           | Separate toilet facilities provided for male and female workers                                 |     |    |                              |
| 77.                           | Septic tank / soak pit constructed and functional                                               |     |    |                              |
| 78.                           | LPG facilities provided for cooking in mess area                                                |     |    |                              |
| 79.                           | Fire extinguishers provided and maintained in working condition                                 |     |    |                              |
| 80.                           | Shelters constructed on raised / paved surface                                                  |     |    |                              |
| 81.                           | Adequate beds / cots provided for all labourers                                                 |     |    |                              |
| 82.                           | Safe and proper electrical facilities provided                                                  |     |    |                              |
| 83.                           | Proper surface water drainage facilities provided                                               |     |    |                              |
| 84.                           | HIV / AIDS awareness posters displayed in camp                                                  |     |    |                              |
| 85.                           | Personal Protective Equipment (PPE) provided to all workers                                     |     |    |                              |
| 86.                           | Labour camp located away from water bodies and sensitive areas                                  |     |    |                              |
| 87.                           | Solid waste collection and disposal system in place                                             |     |    |                              |
| 88.                           | Wastewater disposed through proper treatment system                                             |     |    |                              |
| 89.                           | Emergency contact numbers displayed at prominent locations                                      |     |    |                              |
| 90.                           | Mosquito control measures implemented                                                           |     |    |                              |
| 91.                           | Register of labour maintained at site                                                           |     |    |                              |
| 92.                           | Insurance coverage provided to labourers                                                        |     |    |                              |
| 93.                           | Grievance redressal mechanism available for workers                                             |     |    |                              |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

| Sr. No.                                         | Information                                                                          | Yes | No | Remark/<br>Compliance Status |
|-------------------------------------------------|--------------------------------------------------------------------------------------|-----|----|------------------------------|
| 94.                                             | Child labour not employed at site                                                    |     |    |                              |
| <b>DUST SUPPRESSION</b>                         |                                                                                      |     |    |                              |
| 95.                                             | Subgrade, sub-base and loose materials transported in tarpaulin-covered vehicles     |     |    |                              |
| 96.                                             | Regular water sprinkling carried out on haul roads and active work zones             |     |    |                              |
| 97.                                             | Speed limits displayed and enforced for construction vehicles                        |     |    |                              |
| 98.                                             | Silt fencing / barricading provided at environmentally sensitive locations           |     |    |                              |
| 99.                                             | Stockpiles covered or protected to prevent wind-blown dust                           |     |    |                              |
| 100.                                            | Fine materials stored away from habitation and water bodies                          |     |    |                              |
| 101.                                            | Dust monitoring carried out as per approved Environmental Management Plan            |     |    |                              |
| <b>DISPOSAL OF CONSTRUCTION WASTE</b>           |                                                                                      |     |    |                              |
| 102.                                            | Scarification of existing flexible pavement carried out as per approved method       |     |    |                              |
| 103.                                            | Scarified bitumen stored in designated area with impervious base                     |     |    |                              |
| 104.                                            | No disposal or storage of waste near water bodies or drainage channels               |     |    |                              |
| 105.                                            | Reuse of milled / scarified material in approved locations such as approach roads    |     |    |                              |
| 106.                                            | Disposal of surplus material carried out at approved dumping site                    |     |    |                              |
| 107.                                            | NOC obtained from landowner for disposal site, where applicable                      |     |    |                              |
| 108.                                            | Records of waste generation and disposal maintained at site                          |     |    |                              |
| <b>NOISE CONTROL MEASURES</b>                   |                                                                                      |     |    |                              |
| 109.                                            | No construction activities carried out during night hours near sensitive receptors   |     |    |                              |
| 110.                                            | Noise barriers / acoustic enclosures provided at sensitive receptors, where required |     |    |                              |
| 111.                                            | Regular maintenance of machinery and equipment carried out to control noise          |     |    |                              |
| 112.                                            | DG sets fitted with acoustic enclosure and valid PUC certification                   |     |    |                              |
| 113.                                            | Workers exposed to high noise levels provided with ear protection                    |     |    |                              |
| 114.                                            | Noise levels monitored as per Environmental Management Plan requirements             |     |    |                              |
| <b>ENVIRONMENTAL MANAGEMENT FOR BORROW AREA</b> |                                                                                      |     |    |                              |
| 115.                                            | Photographs of borrow area taken prior to excavation                                 |     |    |                              |
| 116.                                            | Written agreement executed with landowner                                            |     |    |                              |
| 117.                                            | Approval obtained from please confirm for borrow area                                |     |    |                              |
| 118.                                            | Borrow area located outside restricted / environmentally sensitive zones             |     |    |                              |

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| Sr. No.                             | Information                                                         | Yes | No | Remark/<br>Compliance Status |
|-------------------------------------|---------------------------------------------------------------------|-----|----|------------------------------|
| 119.                                | Topsoil stripped separately and preserved for rehabilitation        |     |    |                              |
| 120.                                | Excavation depth maintained as per approved plan                    |     |    |                              |
| 121.                                | Drainage arrangement provided to prevent water stagnation           |     |    |                              |
| 122.                                | Final rehabilitation carried out as per approved restoration plan   |     |    |                              |
| 123.                                | Post-restoration photographs submitted                              |     |    |                              |
| 124.                                | Satisfaction letter / NOC obtained from landowner after restoration |     |    |                              |
| <b>CLOSURE OF CONSTRUCTION CAMP</b> |                                                                     |     |    |                              |
| 125.                                | Photographs of site condition prior to camp establishment available |     |    |                              |
| 126.                                | Agreement with landowner for temporary land use available           |     |    |                              |
| 127.                                | Permission obtained from Gram Panchayat / local authority           |     |    |                              |
| 128.                                | All temporary structures dismantled and debris removed              |     |    |                              |
| 129.                                | Septic tanks, soak pits and waste pits decommissioned safely        |     |    |                              |
| 130.                                | Site levelled and restored to original condition                    |     |    |                              |
| 131.                                | Final rehabilitation photographs available                          |     |    |                              |
| 132.                                | Satisfaction letter / NOC obtained from landowner after closure     |     |    |                              |

### ANNEXURE-6: CLIMATE RISK VULNERABILITY ASSESSMENT (CRVA) AND ADAPTATION MEASURES

The following checklist shall be used in preparation of ESMPs to confirm that climate risks are translated into road-specific design measures, costed items, procurement requirements and operation and maintenance arrangements. For each road or road package, the reviewer should mark the evidence status, record the DPR/BOQ/ESMP reference, and identify any follow-up action needed before finalization of project design documents or procurement.

#### CHECKLIST FOR APPRAISAL AND DPR EVIDENCE ON RESILIENCE AND ADAPTATION MEASURES

| No. | Risk / measure area                  | Checklist item                                                                                                                                                                                                                                                                 | Status                                                                                                 | DPR / BOQ / ESMP reference and follow-up |
|-----|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------|
| 1   | Flooding and drainage exceedance     | <input type="checkbox"/> Hydrological and hydraulic analysis is provided, including design rainfall, flow assumptions, climate-adjusted intensity allowance, return period by asset criticality, freeboard, blockage/debris allowance, catchment model and safe overflow path. | <input type="checkbox"/> Complete<br><input type="checkbox"/> Partial <input type="checkbox"/> Missing | Reference / action:                      |
| 2   | Waterlogging and pavement saturation | <input type="checkbox"/> Waterlogging hotspots, drainage connectivity, subgrade/groundwater conditions, longitudinal and subsurface drainage needs, sealed shoulder requirements, protected outfalls and desilting access are documented.                                      | <input type="checkbox"/> Complete<br><input type="checkbox"/> Partial <input type="checkbox"/> Missing | Reference / action:                      |

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| No. | Risk / measure area             | Checklist item                                                                                                                                                                                                                                                                  | Status                                                                                                 | DPR / BOQ / ESMP reference and follow-up |
|-----|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------|
| 3   | Extreme heat                    | <input type="checkbox"/> Temperature design parameters, pavement option analysis, heat-suitable binders/materials or concrete technology selection, curing/joint specifications<br><input type="checkbox"/> Tree coverage and planting of trees to improve shading is envisaged | <input type="checkbox"/> Complete<br><input type="checkbox"/> Partial <input type="checkbox"/> Missing | Reference / action:                      |
| 4   | Slope erosion and landslides    | <input type="checkbox"/> Landslide susceptibility and geotechnical review, slope-by-slope treatment, slope drainage, retaining/protection structures, bioengineering, spoil management, inspection triggers and emergency access arrangements are provided.                     | <input type="checkbox"/> Complete<br><input type="checkbox"/> Partial <input type="checkbox"/> Missing | Reference / action:                      |
| 5   | Coastal inundation and salinity | <input type="checkbox"/> Coastal water-level, surge and drainage outfall assessment, salinity/corrosion exposure class, embankment protection, scour/erosion protection and residual inundation plan are documented where applicable.                                           | <input type="checkbox"/> Complete<br><input type="checkbox"/> Partial <input type="checkbox"/> Missing | Reference / action:                      |

| No. | Risk / measure area                     | Checklist item                                                                                                                                                                                                                                                 | Status                                                                                                 | DPR / BOQ / ESMP reference and follow-up |
|-----|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------|
| 6   | Operations and maintenance              | <input type="checkbox"/> RAMS climate-risk layers, asset condition and incident data fields, update protocol, inspection schedules, response thresholds, pre-monsoon clearance, post-event inspections, maintenance budget and responsible unit are specified. | <input type="checkbox"/> Complete<br><input type="checkbox"/> Partial <input type="checkbox"/> Missing | Reference / action:                      |
| 7   | Community access and service continuity | <input type="checkbox"/> Criticality classification, links to health, schools, markets and emergency services, stakeholder consultations, temporary access during works, detour plan, warning procedures and resilience indicators are included.               | <input type="checkbox"/> Complete<br><input type="checkbox"/> Partial <input type="checkbox"/> Missing | Reference / action:                      |

- **Maladaptation check:** Confirm that proposed measures do not transfer flooding or erosion to adjacent communities, obstruct natural drainage, increase downstream peak flows, induce settlement in hazard-prone areas, create excessive water demand, or rely on unsuitable or invasive vegetation.
- **Procurement and supervision check:** Confirm that climate-resilience requirements are reflected in DPR terms of reference, technical specifications, BOQs, bidding documents, contract clauses, contractor method statements, supervision checklists, completion testing and asset handover requirements.
- **Climate finance check:** Confirm that each adaptation finance item has a documented vulnerability context, with the intent to address the risk, direct activity linkage, quantity, unit cost, package, financing share, avoided double counting and verification reference.
- **Closure condition:** Confirm that the road-specific CRVA, climate-informed DPRs and cost adaptation schedule demonstrate that material risks are addressed, residual risks are accepted and managed, and no maladaptation is expected.

**ANNEXURE 7: AIR, NOISE, SOIL AND WATER QUALITY  
STANDARDS**  
**SAMBIENT AIR QUALITY STANDARDS (NAAQS 2009)**

| <b>Pollutant</b>                        | <b>Time Weighted Average</b> | <b>Concentration in Ambient Air – Industrial, Residential, Rural &amp; Other Areas (µg/m³)</b> | <b>Ecologically Sensitive Areas (µg/m³)</b> | <b>Measurement Method</b>                              |
|-----------------------------------------|------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------------------------------|
| Sulphur Dioxide (SO <sub>2</sub> )      | Annual Average               | 50                                                                                             | 20                                          | Improved West and Gaeke Method / UV Fluorescence       |
|                                         | 24 Hours                     | 80                                                                                             | 80                                          |                                                        |
| Oxides of Nitrogen (NO <sub>x</sub> )   | Annual Average               | 40                                                                                             | 30                                          | Jacob & Hochheiser Modified Method / Chemiluminescence |
|                                         | 24 Hours                     | 80                                                                                             | 80                                          |                                                        |
| Particulate Matter (PM <sub>10</sub> )  | Annual Average               | 60                                                                                             | 60                                          | Gravimetric Method / TEOM / Beta Attenuation           |
|                                         | 24 Hours                     | 100                                                                                            | 100                                         |                                                        |
| Particulate Matter (PM <sub>2.5</sub> ) | Annual Average               | 40                                                                                             | 40                                          | Gravimetric Method / TEOM / Beta Attenuation           |
|                                         | 24 Hours                     | 60                                                                                             | 60                                          |                                                        |
| Ozone (O <sub>3</sub> )                 | 8 Hours                      | 100                                                                                            | 100                                         | UV Photometric Method                                  |
|                                         | 1 Hour                       | 180                                                                                            | 180                                         |                                                        |
| Carbon Monoxide (CO)                    | 8 Hours                      | 2 mg/m³                                                                                        | 2 mg/m³                                     | Non-Dispersive Infrared Spectroscopy (NDIR)            |
|                                         | 1 Hour                       | 4 mg/m³                                                                                        | 4 mg/m³                                     |                                                        |

- Ambient air quality monitoring shall be carried out through NABL accredited laboratories or approved environmental monitoring agencies.
- Monitoring instruments and equipment shall be calibrated periodically using certified calibration standards and records of calibration shall be maintained at site.
- Air sampling equipment shall be installed at a height of approximately 3 to 10 m above ground level depending upon surrounding conditions and monitoring objectives, in accordance with CPCB guidelines.
- Sampling locations shall be selected away from obstructions such as buildings, trees, and walls to ensure representative ambient air quality data.
- Respirable Dust Sampler (RDS), Fine Particulate Sampler, or Continuous Ambient Air Quality Monitoring Stations (CAAQMS) shall be used as applicable.

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- Monitoring shall be conducted considering predominant wind direction, nearby sensitive receptors, traffic movement, and construction activity zones.
- Monitoring duration for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and NO<sub>x</sub> shall generally be 24 hours with sampling frequency as prescribed in CPCB guidelines.
- Gaseous pollutant monitoring shall be carried out using appropriate absorbing reagents/liquids as prescribed under CPCB and IS standards.
- Potassium Tetrachloromercurate (TCM) solution may be used for SO<sub>2</sub> absorption using Improved West and Gaeke Method.
- Sodium Hydroxide and Sodium Arsenite absorbing solution may be used for NO<sub>x</sub> monitoring using Jacob & Hochheiser Modified Method.
- Ozone (O<sub>3</sub>) monitoring shall be conducted using UV Photometric Method or equivalent approved method.
- Carbon Monoxide (CO) monitoring shall be carried out using Non-Dispersive Infrared Spectroscopy (NDIR) method or equivalent approved analyzer.
- Filter papers used for particulate monitoring shall be conditioned and weighed before and after sampling in controlled laboratory conditions.
- Meteorological parameters such as wind speed, wind direction, temperature, and humidity should be recorded during monitoring wherever applicable.
- All monitoring records, calibration certificates, laboratory analysis reports, field observations, and chain-of-custody documents shall be maintained properly for verification and reporting purposes.

**Water Quality Standards (IS 10500:2012)****1. Physical Parameters**

| <b>Sr. No.</b> | <b>Parameter</b> | <b>Acceptable Limit</b> | <b>Permissible Limit in Absence of Alternate Source</b> | <b>Unit</b> | <b>Method of Test (IS 3025)</b> |
|----------------|------------------|-------------------------|---------------------------------------------------------|-------------|---------------------------------|
| 1              | Colour           | 5                       | 15                                                      | Hazen       | Part 4                          |
| 2              | Odour            | Agreeable               | Agreeable                                               | -           | Part 5                          |
| 3              | pH               | 6.5 – 8.5               | No Relaxation                                           | -           | Part 11                         |
| 4              | Taste            | Agreeable               | Agreeable                                               | -           | Part 7 & 8                      |
| 5              | Turbidity        | 1                       | 5                                                       | NTU         | Part 10                         |
| 6              | TDS              | 500                     | 2000                                                    | mg/L        | Part 16                         |

**2. Chemical Parameters**

| <b>Sr. No.</b> | <b>Parameter</b>                       | <b>Acceptable Limit</b> | <b>Permissible Limit in Absence of Alternate Source</b> | <b>Unit</b> | <b>Method of Test (IS 3025)</b> |
|----------------|----------------------------------------|-------------------------|---------------------------------------------------------|-------------|---------------------------------|
| 1              | Total Hardness (as CaCO <sub>3</sub> ) | 200                     | 600                                                     | mg/L        | Part 21                         |
| 2              | Calcium (as Ca)                        | 75                      | 200                                                     | mg/L        | Part 40                         |
| 3              | Magnesium (as Mg)                      | 30                      | 100                                                     | mg/L        | Part 46                         |
| 4              | Alkalinity (as CaCO <sub>3</sub> )     | 200                     | 600                                                     | mg/L        | Part 23                         |
| 5              | Chloride (as Cl)                       | 250                     | 1000                                                    | mg/L        | Part 32                         |
| 6              | Sulphate (as SO <sub>4</sub> )         | 200                     | 400                                                     | mg/L        | Part 24                         |
| 7              | Nitrate (as NO <sub>3</sub> )          | 45                      | No Relaxation                                           | mg/L        | Part 34                         |
| 8              | Fluoride (as F)                        | 1.0                     | 1.5                                                     | mg/L        | Part 60                         |
| 9              | Iron (as Fe)                           | 0.3                     | No Relaxation                                           | mg/L        | Part 53                         |
| 10             | Manganese (as Mn)                      | 0.1                     | 0.30                                                    | mg/L        | Part 59                         |

## 3. Toxic Substance

| Sr. No. | Parameter     | Acceptable Limit | Permissible Limit in Absence of Alternate Source | Unit | Method of Test (IS 3025) |
|---------|---------------|------------------|--------------------------------------------------|------|--------------------------|
| 1       | Arsenic (As)  | 0.01             | 0.05                                             | mg/L | Part 37                  |
| 2       | Lead (Pb)     | 0.01             | No Relaxation                                    | mg/L | Part 47                  |
| 3       | Cadmium (Cd)  | 0.003            | No Relaxation                                    | mg/L | Part 41                  |
| 4       | Chromium (VI) | 0.05             | No Relaxation                                    | mg/L | Part 52                  |
| 5       | Mercury (Hg)  | 0.001            | No Relaxation                                    | mg/L | Part 48                  |
| 6       | Cyanide (CN)  | 0.05             | No Relaxation                                    | mg/L | Part 27                  |

## 4. Microbiological Parameters

| Sr. No. | Parameter                         | Acceptable Limit                             | Permissible Limit                            | Unit               | Method                            |
|---------|-----------------------------------|----------------------------------------------|----------------------------------------------|--------------------|-----------------------------------|
| 1       | E. coli / Thermotolerant Coliform | Shall not be detectable in any 100 ml sample | Shall not be detectable in any 100 ml sample | MPN Index / 100 ml | APHA 24th Edition 9221-B, IS 1622 |
| 2       | Total Coliform                    | Shall not be detectable in any 100 ml sample | Shall not be detectable in any 100 ml sample | MPN Index / 100 ml | APHA 24th Edition 9221-B, IS 1622 |

- Water quality monitoring shall be carried out through NABL accredited laboratories or approved environmental monitoring agencies.
- Sampling, preservation, transportation, and analysis of water samples shall be conducted in accordance with IS 3025 methods, APHA Standards, and CPCB guidelines.
- Water samples shall be collected from representative locations including surface water bodies, hand pumps, borewells, wells, labour camps, nearby villages, and other sensitive receptors within the project influence area.
- Samples shall be collected using pre-cleaned and sterilized sampling bottles of suitable material and capacity as per the parameter to be analyzed.
- Separate containers and preservatives shall be used for physico-chemical, heavy metal, and microbiological analysis as per standard protocols.
- Sample preservation techniques such as cooling, acidification, or addition of preservatives shall be adopted immediately after sample collection wherever required.
- pH, temperature, dissolved oxygen, and residual chlorine shall preferably be measured at site during sample collection using calibrated field instruments.
- Instruments used for water quality monitoring shall be calibrated periodically using certified reference standards and calibration records shall be maintained.
- Sampling locations shall be selected considering upstream and downstream conditions, drainage pattern, nearby discharge points, construction activities, and community water usage.
- Water samples for microbiological analysis shall be collected in sterilized bottles and analyzed within the prescribed holding time.
- Chain-of-custody records, field observation sheets, laboratory analysis reports, and calibration certificates shall be maintained properly for verification and reporting purposes.
- Monitoring frequency shall be as specified in the Environmental Monitoring Plan (EMoP) and applicable statutory guidelines.
- In case monitored values exceed prescribed standards, immediate corrective and preventive measures shall be implemented.
- Wastewater from labour camps, construction camps, batching plants, and equipment washing areas shall not be discharged directly into nearby water bodies without appropriate treatment.
- Adequate precautions shall be taken during sampling to avoid contamination, disturbance of sediments, or alteration of sample characteristics.

**Noise Level Standards (Noise Pollution Rules, 2000)**

| <b>Area / Zone Classification</b> | <b>Day Time Limit dB(A) Leq</b> | <b>Night Time Limit dB(A) Leq</b> | <b>Time Duration</b>                                | <b>Measurement Method / Instrument</b>                                        |
|-----------------------------------|---------------------------------|-----------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------|
| Industrial Area                   | 75                              | 70                                | Day: 6:00 AM to 10:00 PM Night: 10:00 PM to 6:00 AM | Integrated Sound Level Meter / Noise Level Meter complying with IEC standards |
| Commercial Area                   | 65                              | 55                                | Day: 6:00 AM to 10:00 PM Night: 10:00 PM to 6:00 AM | Integrated Sound Level Meter / Noise Level Meter complying with IEC standards |
| Residential Area                  | 55                              | 45                                | Day: 6:00 AM to 10:00 PM Night: 10:00 PM to 6:00 AM | Integrated Sound Level Meter / Noise Level Meter complying with IEC standards |
| Silence Zone*                     | 50                              | 40                                | Day: 6:00 AM to 10:00 PM Night: 10:00 PM to 6:00 AM | Integrated Sound Level Meter / Noise Level Meter complying with IEC standards |

- Noise monitoring shall be carried out in accordance with the Noise Pollution (Regulation and Control) Rules, 2000 and subsequent amendments.
- Silence Zone refers to areas up to 100 m around hospitals, educational institutions, courts, and religious places or any area declared as such by the competent authority.
- Noise monitoring shall be conducted using calibrated Integrated Sound Level Meter / Noise Level Meter complying with applicable IEC standards.
- Monitoring locations shall include construction sites, labour camps, hot mix plants, batching plants, crusher locations, settlements, schools, hospitals, junctions, and other sensitive receptors.
- Monitoring shall be undertaken during pre-construction, construction, operation, and maintenance stages as specified in the Environmental Monitoring Plan (EMoP).
- Equivalent Continuous Sound Pressure Level [Leq dB(A)] shall be considered for ambient noise assessment.
- Corrective and preventive measures such as noise barriers, equipment maintenance, acoustic enclosures, restricted working hours, and plantation buffers shall be implemented in case of exceedance of prescribed limits.
- Night-time construction activities near residential and sensitive receptors shall be minimized to the extent possible.
- All construction machinery and vehicles shall be maintained in good working condition to minimize noise generation.
- Personal Protective Equipment (PPE) such as ear plugs and ear muffs shall be provided to workers exposed to high noise levels.

**Soil Quality Standards (ICAR & CPCB Guideliens)**

| <b>Sr. No.</b> | <b>Parameter</b>         | <b>Indicative Standard / Guideline Value</b> | <b>Unit</b> | <b>Method / Reference</b>           |
|----------------|--------------------------|----------------------------------------------|-------------|-------------------------------------|
| 1              | Available Nitrogen (N)   | > 280 (High Fertility)                       | kg/ha       | Alkaline Permanganate Method / ICAR |
| 2              | Available Phosphorus (P) | > 25 (High Fertility)                        | kg/ha       | Olsen's Method / ICAR               |
| 3              | Available Potassium (K)  | > 280 (High Fertility)                       | kg/ha       | Flame Photometric Method / ICAR     |
| 4              | Arsenic (As)             | 20                                           | mg/kg       | USEPA / CPCB Guidelines             |
| 5              | Lead (Pb)                | 250                                          | mg/kg       | USEPA / CPCB Guidelines             |
| 6              | Cadmium (Cd)             | 3                                            | mg/kg       | USEPA / CPCB Guidelines             |
| 7              | Chromium (Cr)            | 50                                           | mg/kg       | USEPA / CPCB Guidelines             |
| 8              | Mercury (Hg)             | 0.3                                          | mg/kg       | USEPA / CPCB Guidelines             |
| 9              | Nickel (Ni)              | 50                                           | mg/kg       | USEPA / CPCB Guidelines             |
| 10             | Zinc (Zn)                | 300                                          | mg/kg       | USEPA / CPCB Guidelines             |

- Soil quality monitoring shall be carried out through NABL accredited laboratories or approved environmental monitoring agencies.
- Soil samples shall be collected and analyzed in accordance with ICAR guidelines, CPCB recommendations, and standard soil testing procedures.
- Sampling locations shall include construction sites, labour camps, borrow areas, plant locations, agricultural land near project corridor, disposal sites, and environmentally sensitive locations.
- Soil samples shall generally be collected from surface depth of 0–15 cm and sub-surface depth where required depending upon site conditions and project activities.
- Separate composite soil samples shall be collected from representative locations to avoid cross contamination and to ensure representative assessment.
- Stainless steel augers, core cutters, or non-corrosive sampling tools shall be used for sample collection.
- Samples shall be collected in clean polythene bags or suitable containers, properly labeled, sealed, and preserved for laboratory analysis.
- Instruments used for soil analysis shall be calibrated periodically using certified standards and calibration records shall be maintained.
- Soil monitoring shall include assessment of fertility parameters, heavy metals, oil & grease contamination, pH, electrical conductivity, and other project-specific parameters wherever applicable.
- Soil erosion prone areas, embankments, cut sections, and drainage discharge locations shall be monitored regularly during construction activities.
- Contaminated soil generated due to fuel, oil, bitumen, chemicals, or hazardous material spillages shall be collected, stored, and disposed of as per applicable regulations.

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- Borrow areas, construction camps, hot mix plants, batching plants, and crusher areas shall be restored and rehabilitated after completion of construction activities.
- Chain-of-custody records, laboratory reports, field observation sheets, and photographic records shall be maintained properly for monitoring and reporting purposes.
- In case monitored values exceed prescribed standards or indicate contamination, immediate corrective and preventive measures shall be implemented.

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**ANNEXURE 8: GENERIC ENVIRONMENTAL MONITORING PLAN (EMoP)**

| <b>Environmental Indicator</b> | <b>Project Stage</b>          | <b>Parameters / Aspects</b>                                         | <b>Method</b>              | <b>Locations</b>                                                                    | <b>Frequency &amp; Duration</b>                           | <b>Standards / Reference</b>                         | <b>Implementation Responsibility</b> | <b>Supervision Responsibility</b> |
|--------------------------------|-------------------------------|---------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------|--------------------------------------|-----------------------------------|
| Ambient Air Quality            | Construction Phase            | PM10, PM2.5, SO <sub>2</sub> , NO <sub>x</sub> , CO, O <sub>3</sub> | NABL Approved Laboratories | Construction sites, labour camps, plant locations, settlements, sensitive receptors | Quarterly Excluding Monsoon for construction period       | National Ambient Air Quality Standards (NAAQS), 2009 | Contractor                           | / PIU                             |
| Ambient Air Quality            | Operation & Maintenance Phase | PM10, PM2.5, SO <sub>2</sub> , NO <sub>x</sub> , CO, O <sub>3</sub> | NABL Approved Laboratories | Representative residential and sensitive locations                                  | Quarterly Excluding Monsoon for 1 year maintenance period | NAAQS, CPCB                                          | Contractor                           | / PIU                             |
| Noise Levels                   | Construction Phase            | Day and Night Noise Levels dB(A)                                    | NABL Approved Laboratories | Construction sites, settlements, schools, hospitals, camps                          | Quarterly Excluding Monsoon for construction period       | CPCB Ambient Noise Standards                         | Contractor                           | / PIU                             |
| Noise Levels                   | Operation & Maintenance Phase | Day and Night Noise Levels dB(A)                                    | NABL Approved Laboratories | Sensitive receptors and roadside settlements                                        | Quarterly Excluding Monsoon for 1 year maintenance period | CPCB Ambient Noise Standards                         | Contractor                           | / PIU                             |
| Water Quality                  | Construction Phase            | IS 10500 parameters for drinking water quality                      | NABL Approved Laboratories | Labour camps, hand pumps, nearby villages                                           | Quarterly Excluding Monsoon for construction period       | IS:10500                                             | Contractor                           | / PIU                             |

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| Environmental Indicator | Project Stage                 | Parameters / Aspects                                                                        | Method                     | Locations                                                                  | Frequency & Duration                                      | Standards / Reference  | Implementation Responsibility | Supervision Responsibility  |
|-------------------------|-------------------------------|---------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------|------------------------|-------------------------------|-----------------------------|
| Water Quality           | Operation & Maintenance Phase | IS 10500 parameters for drinking water quality                                              | NABL Approved Laboratories | Selected water bodies and groundwater sources                              | Quarterly Excluding Monsoon for 1 year maintenance period | IS:10500               | Contractor                    | / PIU                       |
| Soil Quality            | Construction Phase            | pH, Heavy Metals, Oil & Grease, Nutrients                                                   | NABL Approved Laboratories | Construction camps, borrow areas, disposal areas, agricultural land nearby | Quarterly Excluding Monsoon for construction period       | ICAR / CPCB Guidelines | Contractor                    | PIU                         |
| Soil Quality            | Operation & Maintenance Phase | Oil & Grease and contamination indicators                                                   | NABL Approved Laboratories | Maintenance work areas and spill-prone locations                           | Quarterly Excluding Monsoon for 1 year maintenance period | CPCB Guidelines        | Contractor                    | PIU                         |
| Biodiversity monitoring | Operation & Maintenance Phase | Trees removed, trees planted, plantation survival, wildlife incidents, restoration of sites | PMU                        | Planted areas                                                              | Regularly                                                 | Per agreed plan        | PMU                           | PMU through agencies/ staff |

## ANNEXURE: ENVIRONMENT AND SOCIAL MANAGEMENT PLANNING FRAMEWORK

**ANNEXURE 9: BIODIVERSITY SCREENING CHECKLIST**

During DPR preparation, road sections identified as likely to trigger re-categorization to Category A or involving Category A or high-risk Category B impacts shall be excluded from the project scope.

| Sr. No. | Screening Question                                                                                                                                                    | Yes | No | Remarks / Required Action                                    |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--------------------------------------------------------------|
| 1.      | Are all road improvement works confined to the existing RoW?                                                                                                          |     |    |                                                              |
| 2.      | Does the proposal involve a new road alignment, bypass or missing link outside the existing RoW?                                                                      |     |    |                                                              |
| 3.      | Is additional land required outside the existing RoW for widening, structures, camps, access or other facilities?                                                     |     |    |                                                              |
| 4.      | Is the proposed road section located within or adjacent to a Protected Area (National Park, Wildlife Sanctuary, Conservation Reserve, Community Reserve, etc.)?       |     |    | Detailed biodiversity assessment required.                   |
| 5.      | Is the road section located within or near an Eco-Sensitive Zone (ESZ), Reserved Forest, Protected Forest, or other legally protected habitat?                        |     |    | Assess habitat impacts and statutory requirements.           |
| 6.      | Does the corridor pass through or near natural habitats, wetlands, rivers, lakes, mangroves, grasslands, or other ecologically sensitive areas?                       |     |    | Habitat assessment required.                                 |
| 7.      | Are there records or evidence of wildlife movement, wildlife crossings, or wildlife-vehicle collisions along the road section?                                        |     |    | Evaluate wildlife crossing and safety measures.              |
| 8.      | Does the road section intersect or potentially affect wildlife corridors, habitat connectivity routes, or migratory pathways?                                         |     |    | Assess need for wildlife passages and connectivity measures. |
| 9.      | Are any threatened, endangered, endemic, protected, or Schedule species of flora or fauna known or likely to occur within the area of influence?                      |     |    | Conduct focused ecological assessment.                       |
| 10.     | Will the project require removal of roadside trees, avenue plantations, or native vegetation?                                                                         |     |    | Prepare tree inventory and compensatory plantation plan.     |
| 11.     | Will construction activities affect water bodies, riparian vegetation, aquatic habitats, or fish migration routes?                                                    |     |    | Assess aquatic biodiversity impacts.                         |
| 12.     | Are borrow areas, quarries, construction camps, batching plants, or disposal sites proposed in or near environmentally sensitive areas?                               |     |    | Identify alternative locations and mitigation measures.      |
| 13.     | Is there potential for cumulative biodiversity impacts due to multiple road sections, associated facilities, or concurrent infrastructure projects within the region? |     |    | Conduct cumulative impact assessment, where applicable.      |

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|     |                                                                                                                                                   |  |  |                                                                   |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-------------------------------------------------------------------|
| 14. | Is there potential for increased wildlife mortality due to increased traffic speed, traffic volume, or road widening?                             |  |  | Consider traffic calming measures, signage, and speed management. |
| 15. | Are invasive alien plant species present or likely to spread due to construction activities?                                                      |  |  | Include invasive species management measures.                     |
| 16. | Are there ecologically important trees, sacred groves, community forests, or other locally significant biodiversity resources along the corridor? |  |  | Avoidance and protection measures required.                       |
| 17. | Is there any likelihood of significant habitat fragmentation resulting from the proposed road improvement?                                        |  |  | Evaluate design alternatives and connectivity measures.           |