

# Training

## Implementation of Environment Management Plan

**Targeted Group:  
CMU & Contractor Engineers**

# Periodic Maintenance Work Roads, PSRSP – Environment Component

## Project Background

Feasibility Study – Screening



Scoping



Environment Impact Assessment (EIA)



Environment Management Plan (EMP)



EMP Implementation

# Impacts due to Highway Project

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## Air Quality

- Generation of Dust
- Generation of Exhaust Gases

## Noise Pollution

- Hot-mix Plant and Crushers
- Construction Activities
- Vehicles and Machinery

## Soil Pollution

- Loss of Productive Soil
- Soil erosion
- Compaction of Soil
- Contamination of Soil

# Impacts due to Highway Project

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## Water Resources:

- Loss of Water Supply sources
- Run-off and Drainage
- Water Quality Degradation
- Ground Water Depletion and Pollution
- Local Water Supply for Construction

# Impacts due to Highway Project

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Other Adverse Impacts includes of:

- Impacts due to Mining Activities (aggregates)
- Impacts due to sand mining from River Beds
- Accidents and Safety Issues
- Pollution due to Debris and Wastes Generated
- Inconveniences during construction period (Dust, Noise, Traffic Diversions, Access Blockage)

# Environment Management Plan

The background features a dark blue-grey gradient with faint, light grey line art. On the left side, there is a compass rose with a needle pointing towards the top-left. The compass has markings for North (N), South (S), East (E), and West (W). To the right of the compass, there is a faint outline of a map or geographical area with various irregular shapes representing landmasses or regions.

**What Actually is EMP????**

**“Environment  
Management Plan is a  
Tool”**

# Purpose of EMP.....

- ❖ Minimize Negative Impacts
- ❖ Enhance Positive Impacts
- ❖ Helps in bringing in Environment friendly planning, construction and operations management
- ❖ Reduce Problems and Delays during implementation
- ❖ Improve Over-all Project Quality

# Need for EMP

- ❖ Over-all neglect in complying with environmental and safety specifications
- ❖ Ambiguities in MoRTH/IRC specifications
- ❖ To bring ‘sustainability’ into focus

# Aspects Covered ...

- ❖ Water
- ❖ Air
- ❖ Soil
- ❖ Noise
- ❖ Damage to Flora and Fauna
- ❖ Disruption to Users
- ❖ Traffic Control and Safety
- ❖ Construction Materials
- ❖ Worker's Accident Risks
- ❖ Workers' Health Risks including Hygiene
- ❖ Enhancement of natural and man-made features

# Pre – Construction Stage

## Cl. P.2.3 Location of Crushers, Hot-mix plants, WMM plants, Concrete Batching Plant

- ❖ Plants to be set up away from settlements (1000 m) in downwind direction
- ❖ Mobile equipment within 100 m
- ❖ Arrangement of dust control measures
- ❖ Specification of all plants to meet relevant current legislation norms
- ❖ Submission of all plants “No Objection Certificated” to PRBDB
- ❖ No plant operation till complete submission of legal clearances to PRBDB

## Cl. 2.4 Other Construction vehicles, Equipment and Machinery

- ❖ All vehicle to confirm relevant BIS norm and manufacture specification
- ❖ Environment Protection (EP) Act, 1986 will be strictly adhered
- ❖ Noise limit of equipments not to exceed the limit specified in EP Act 1986

# Pre – Construction Stage

## Cl. P.3.1 Borrow Area

- ❖ Borrow Area identification sole responsibility of Contractor
- ❖ Reporting of finalized Borrow Area to PRBDB
- ❖ No operation of Borrow area unless: a) formal agreement between land owner and Contractor, b) copy of agreement is submitted to Engineer and PRBDB
- ❖ Inspection of identified Borrow Area by Environment Officer, PRBDB prior to approval

## Cl. P.3.2 Quarry

- ❖ Contractor to obtain required permission for procurement of material from concerned departments and submission of copy of approval/permission obtained.
- ❖ For new quarry Rehabilitation Plan to be submitted to PRBDB, prior to operation.

## Cl. P.3.2 Haulage Planning

- ❖ Contractor to work out haul road network and report to Engineer, who in turn will report to PRBDB for approval.
- ❖ If agriculture area is used, then Rehabilitation Plan to be submitted.

# Pre – Construction Stage

## Cl. P.3.2 Haulage Planning

- ❖ Haulage route shall avoid agriculture area, health care facilities, Schools and settlements.
- ❖ If village road is used, then it shall be maintained into trafficable condition and rehabilitated after completion

## Cl. P.3.4 Arrangement for Construction Water

- ❖ Contractor will provide a list of locations and type of sources of water in consultation with Environment Officer, PRBDB and will set up his own bore well facility for construction work
- ❖ Contractor will obtain written consent from the owner or community for use of pond water and submit a copy for same to Engineer.
- ❖ Avoid disruption/disturbance to other water users and extract water from fixed locations
- ❖ Contractor will not be allowed to pump from any irrigation canal and surface water bodies used by the community

## Cl. P.4 Labour Requirement

- ❖ Preference to local people in general and Project Affected Persons in particular

# Pre – Construction Stage

## Cl. P.5 Construction Camp Locations – Selection, Design and Lay out

- ❖ Contractor will identify location and will report to PRBDB
- ❖ Camp site – 1000m from nearest settlements
- ❖ Location of stockyard – 500 m from water courses
- ❖ Contractor to design, built and operate waste disposal system in camp
- ❖ Contractor will provide night soil disposal system if not provided by local medical health or municipal authority or as directed by Environment Officer, PRBDB

## Cl. P.6 Arrangement for Temporary Land

- ❖ Sole responsibility of contractor for arranging land for camp, hot mix plant, traffic detour, borrow area etc.
- ❖ Contractor will clean/restoration all sites disturbed prior to hand over to owner

# Construction Stage

## Cl. C.1.2 Disposal of Debris from Dismantle Structure and Road Surface

- ❖ Contractor will identified pre-designated disposal site for disposal of waste or subject to approval of Environment Officer.
- ❖ Sloe responsibility of contractor to arrange – transportation, maintenance, dismantling and debris clearing or as directed by Environment Officer.

## Cl. C.1.3 Other Construction Waste Disposal

- ❖ Contractor will prepare a detail “Comprehensive Solid Waste Disposal Plan” with approval of Environment Officer.
- ❖ Joint inspection of all disposal site by Environment Officer and Contractor prior to approval.
- ❖ Unsuitable materials not to disposed off near: water course, agriculture land, natural habitat, pasture land etc.
- ❖ All disposal site will be certified by Environment Officer prior to handing over.
- ❖ Contractor will resolve all clams arising out of waste disposal at his own cost.

## Cl. C.1.4 Stripping, Stocking and Preservation of Top Soil

- ❖ Top soils from area of cutting will be stripped off up to a depth of 150mm and stockpiled.

# Construction Stage

## Cl. C.1.5 Accessibility

- ❖ Contractor will provide safe and convenient passage for vehicles, pedestrians and livestock, if necessary, temporary connecting road.
- ❖ Contractor will also ensure, existing accesses are not blocked without providing adequate provisions.

## Cl. C.1.6 Planning for Traffic Diversions and Detours

- ❖ Temporary diversions constructed after approval of the Engineer and Environmental Officer.
- ❖ Specific safety measures for: pedestrian and Workers working at night
- ❖ Diversion/detour always maintained in running condition (especially monsoon)
- ❖ Sprinkling of water three times a day to keep Diversion/Detours are dust free
- ❖ Traffic control plans shall contain:
  - a) details of diversions,
  - b) traffic safety arrangements during construction
  - c) safety measures for night time traffic; and,
  - d) transportation of hazardous materials

# Construction Stage

## Cl. C.2.1 Earth from Borrow Area for Construction

- ❖ Contractor will submit “Borrow Area Rehabilitation Plan” and will rehabilitate the borrow areas as soon as borrowing is over.
- ❖ Without permission of the Environmental Officer, no Borrow area will be opened.

## Cl. C.2.2 Quarry Operation

- ❖ For new quarries - consent of the Department of Mining / PPCB/ District Administration is needed or will be use the existing approved sources of such materials.
- ❖ Copy of the consent/ approval for opening or use of a quarry source will be submitted to Environmental Officer.

## Cl. C.2.3 Transporting Construction Materials and Haul Road Management

- ❖ Contractor will maintain all roads used for transporting construction materials, equipment and machinery.
- ❖ Compact haul roads. Provide a layer of coarse aggregate on top and roll it to prevent generation of dust.
- ❖ Sprinkle water on the haul roads at regular interval decided by the Environmental Officer.

# Construction Stage

## Cl. C.3.1 Disruption to Other Users of Water

- ❖ Contractor at its cost will arrange adequate supply for the whole construction period.
- ❖ Precaution to minimize the wastage of water in the construction process/ operation

## Cl. C.3.2 Drainage

- ❖ Contractor will take necessary measures to prevent the blockage of water flow.
- ❖ Contractor will take all required measures to prevent temporary or permanent flooding of the site or any adjacent area.

## Cl. C.3.3 Siltation of Water Bodies and Degradation of Water Quality

- ❖ Contractor will not excavate beds of any stream/canals/ any other water body for borrowing earth.
- ❖ Contractor will ensure that sediment-laden water does not drain into nearby water course.

# Construction Stage

## Cl. C.3.4 Slope Protection and Control of Soil Erosion



- ❖ Contractor will take slope protection measures to control soil erosion and sedimentation on the basis of site conditions.
- ❖ Turfing works will be taken up as soon as possible provided the season is favorable.

## Cl. C.4.1 Water Pollution from Construction Wastes

- ❖ Contractor will take measures to prevent the wastewater generated during construction from entering into streams, water bodies or the irrigation system.
- ❖ Waste arising from the project is to be disposed off in the manner that is acceptable to the State Pollution Control Board

## Cl. C.4.1.2 Water Pollution from Fuel and Lubricants

- ❖ Parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites - at least 100 m from water bodies.
- ❖ Location and lay-out plans of such sites will be submitted by the Contractor prior to their establishment for approval from Environment Officer.
- ❖ Spillage of fuels and lubricants does not contaminate the ground

# Construction Stage

## Cl. C.4.1.2 Water Pollution from Fuel and Lubricants

- ❖ Spillage of fuels and lubricants does not contaminate the ground.
- ❖ Oil interceptors will be provided for vehicle parking, wash down and refueling areas.
- ❖ All spills and collected petroleum products will be disposed off in accordance with MoEF and state PCB guidelines.
- ❖ Environmental Officer will certify that all arrangements comply with the guidelines of PCB/ MoEF or any other relevant laws.

## Cl. C.4.2.1 Dust Pollution

- ❖ Consent to establish and operate HHP, concrete batching plant, crusher – Air (Prevention and Pollution control) Act, 1981.
- ❖ Precaution to reduce the level of dust by sprinkling of water, encapsulation of dust source and by erection of screen/barriers.
- ❖ Plants located at least 1 km in the downwind direction from the nearest human settlement.
- ❖ Provide necessary certificates for all crushers used in construction conform to relevant dust emission control legislation.

# Construction Stage

## Cl. C.4.2.2 Emission from Construction Vehicles, Equipment and Machineries

- ❖ Contractor will ensure that all vehicles, equipment and machinery (pollution emission levels) comply with requirements of PPCB.
- ❖ Contractor will submit PUC certificates for all vehicles/ equipment/machinery used for the project.

## Cl. C.4.3.1 Noise Pollution: Noise from Vehicles, Plants and Equipments

- ❖ Plants and equipment used in construction shall strictly conform to the MoEF/CPCB/PPCB noise standards.
- ❖ Vehicles and equipment used in construction will be fitted with exhaust silencers.
- ❖ Limits of noise emission for construction equipment shall not exceed 75 dB.
- ❖ No Construction activity near (100 m) sensitive areas between 9.00 pm to 6.00 am.

# Construction Stage

## Cl. C.4.1 Personal Safety Measures for Labour

- ❖ Contractor will provide labour with: Protective footwear, protective goggles, Earplugs, Luminous jacket, hard hats and hand gloves.
- ❖ International Labor Organization (ILO) Convention No. 62 as far as those are applicable to this contract.
- ❖ Contractor will not employ any person below the age of 14 years for any work and no woman will be employed on the work of painting with products containing lead in any form.

## Cl. C.4.2 Traffic and Road Safety

- ❖ Contractor will take all necessary measures like barricading, including signs, markings, flags, lights and flagmen as proposed in the Traffic Control Plan/Drawings.
- ❖ Contractor will ensure that all signs, barricades, pavement markings are provided as per the MoRTH specifications.
- ❖ Before taking up construction on any section, a Traffic Management Plan will be devised and implemented to the satisfaction of the Environmental Officer.

# Construction Stage

## Cl. C.4.5 First Aid

- ❖ A readily available first aid unit including adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone.
- ❖ Suitable transport at all times to take injured or sick person(s) to the nearest hospital

## Cl. C.6.1 Accommodation

- ❖ Contractor will adhere to all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.
- ❖ The location, layout and basic facility provision of each labour camp will be submitted to Engineer and PRBDB and construction commence after written approval of the Environmental Officer.
- ❖ Will maintain living accommodation and ancillary facilities in functional and hygienic manner and as approved by the Engineer.

# Construction Stage

## Cl. C.6.2 Portable Water

- ❖ In all Labour accommodation, uncontaminated water is available for drinking, cooking and washing.
- ❖ Water storage tank at least 1mt. above the surrounding ground level.
- ❖ Well within 30m proximity to toilet will be disinfected before water is used for drinking.
- ❖ Testing of water will be done every month as per parameters prescribed in IS 10500:1991

## Cl. C.6.3 Sanitation and Sewerage System

- ❖ Sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs.
- ❖ Separate toilets/bathrooms, for men and women (marked in vernacular) are to be provided.
- ❖ All toilets are to be cleaned and kept in a strict sanitary condition.

# Construction Stage

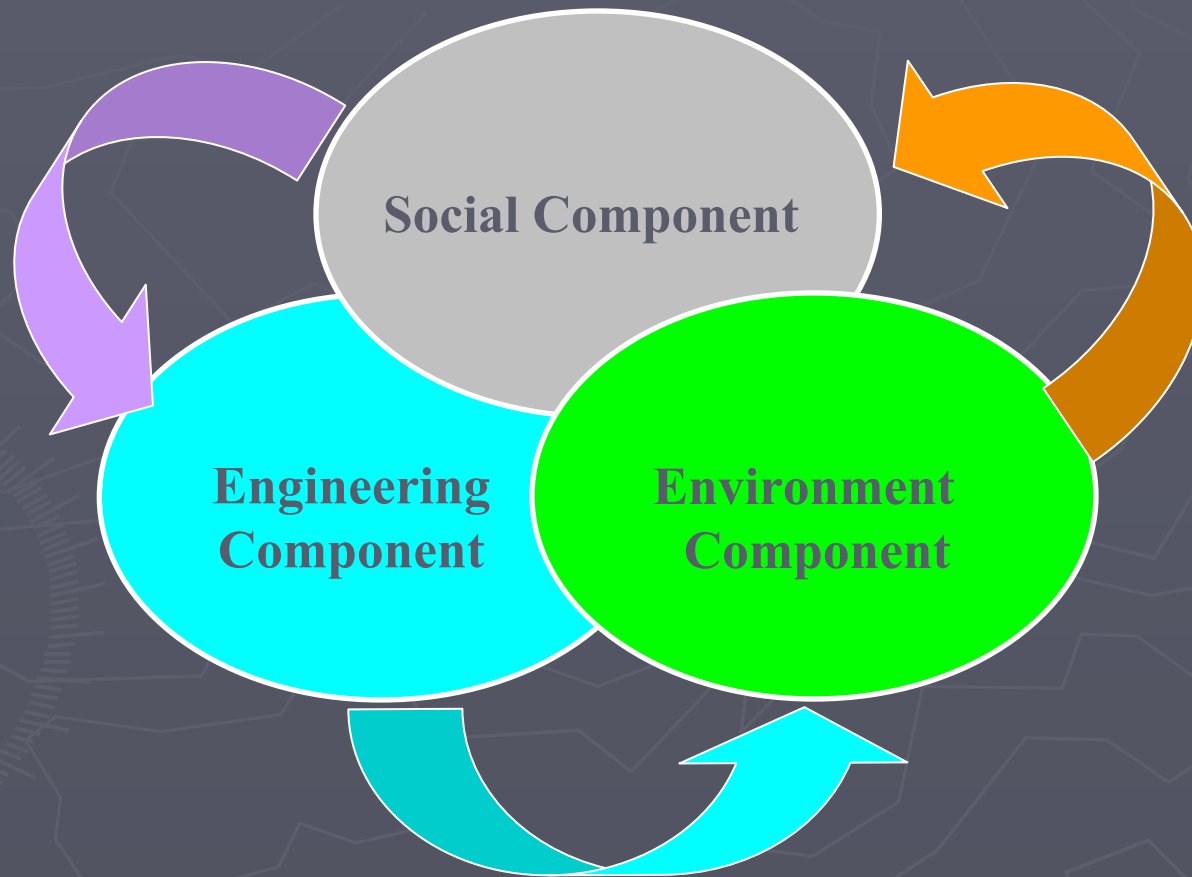
## Cl. C.6.4 Waste Disposal

- ❖ Segregated garbage bins in the camps and ensure that these are regularly emptied and disposed off as per the Comprehensive Solid Waste Management Plan

## Cl. C.7.12 Clean-up Operations, Restoration and Rehabilitation

- ❖ Clean-up and restoration operations are to be implemented by the Contractor prior to demobilization.
- ❖ Contractor will clear all temporary structures; dispose all garbage, night soils and POL waste as per Comprehensive Waste Management Plan and as approved by Engineer.
- ❖ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, at the contractor's expense, to the entire satisfaction to the Environmental Expert .

**“Good Environment Management  
means  
Good Construction Management”**



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# Thank You