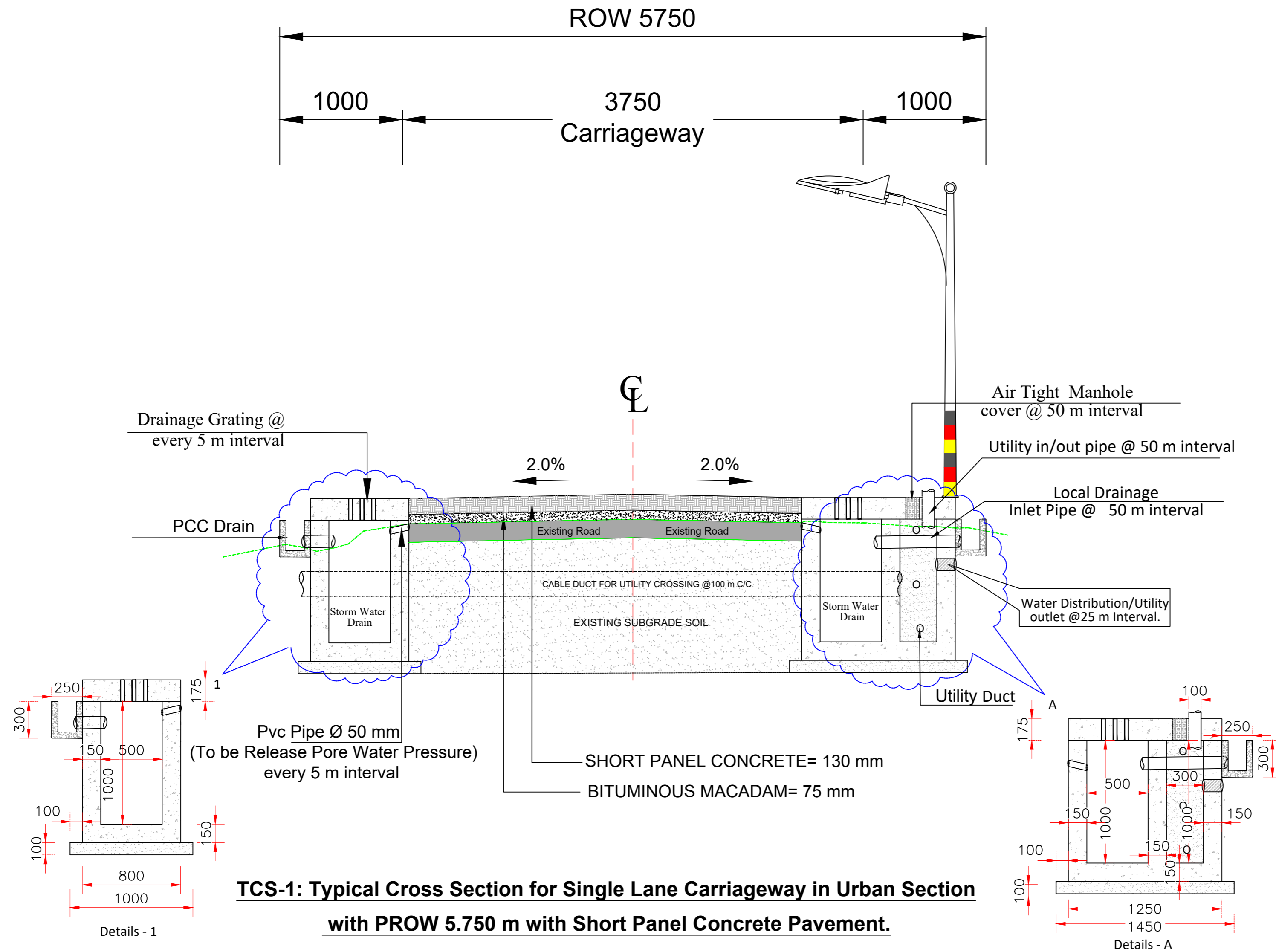
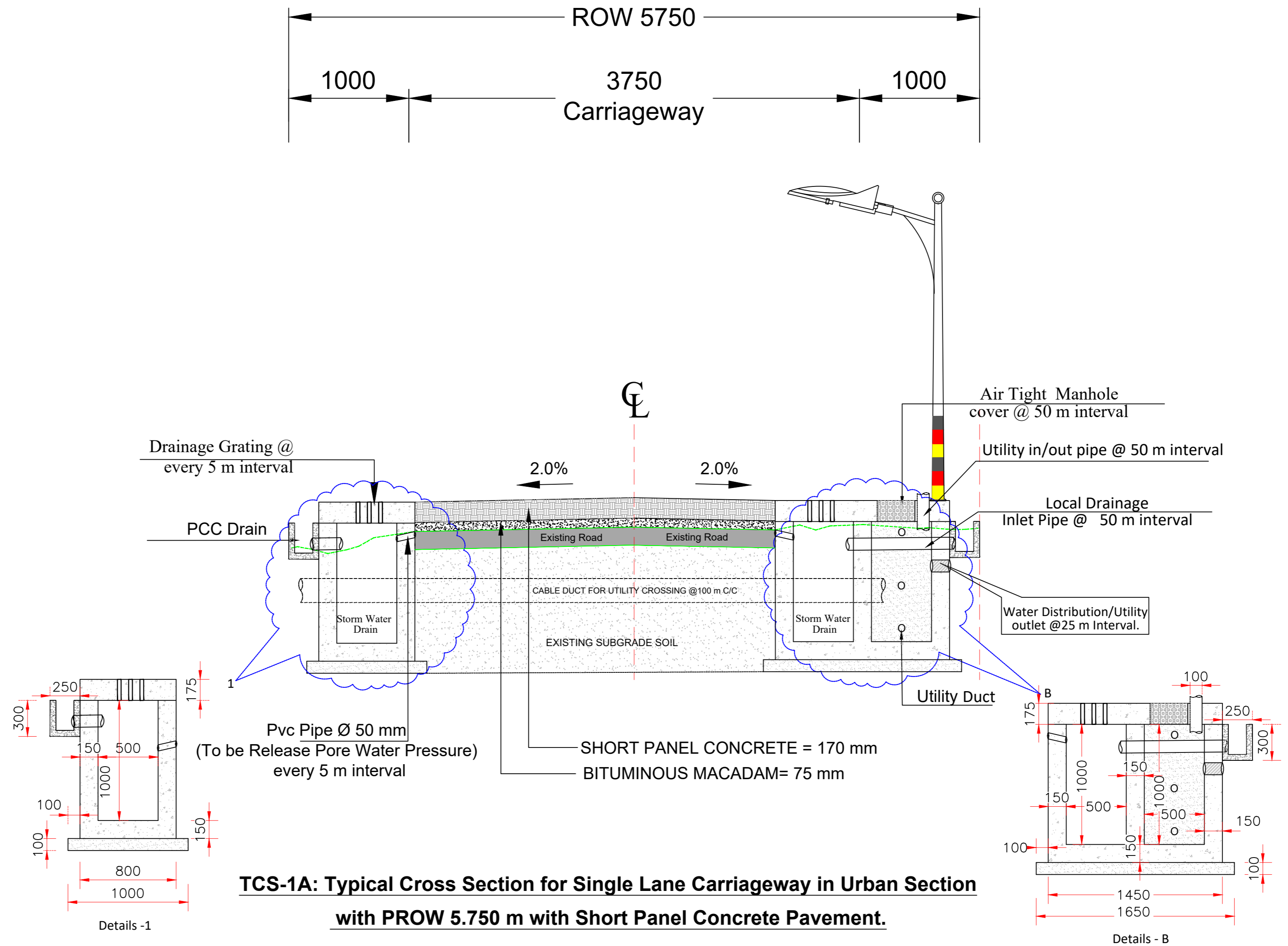


# ***ANNEXURE - 1 - TYPICAL CROSS SECTION***



**Note :-  
Street light to be fixed on one side at every 35m interval**

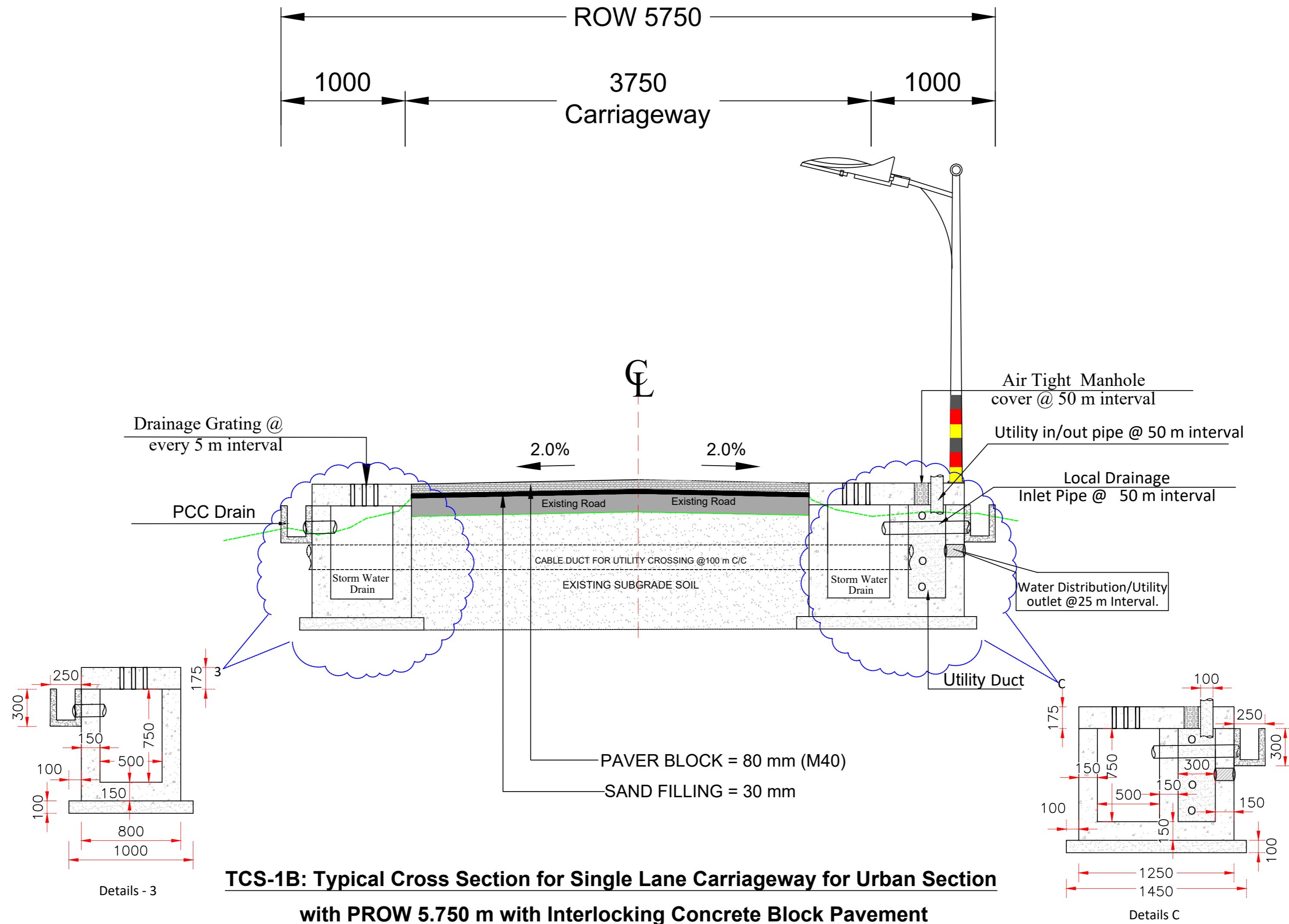
ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains
R0	March, 2023		 PUBLIC WORKS DEPARTMENT Government of Manipur	 <b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)	DRAFT DETAILED PROJECT REPORT  Scale:- AS SHOWN	Drawing Title TYPICAL CORSS SECTION  Sheet size: A2 RC/1604/HO/HWB/RD/DWG/TCS/01/R0



**TCS-1A: Typical Cross Section for Single Lane Carriageway in Urban Section with PROW 5.750 m with Short Panel Concrete Pavement.**

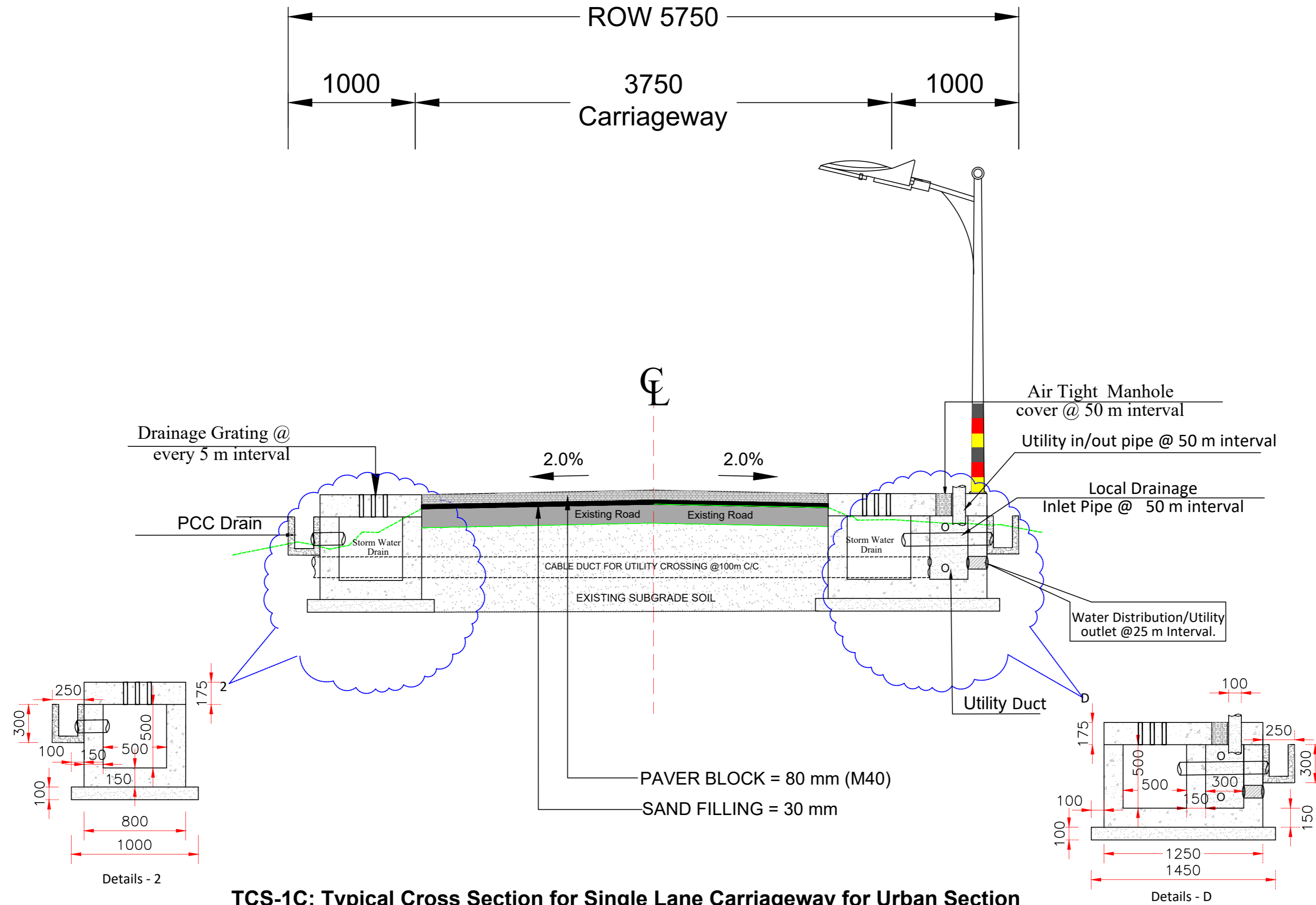
**Note :-  
Street light to be fixed on one side at every 35m interval**

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains								
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	TYPICAL CORSS SECTION								
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Designed:	Scale:-													
Drawn:	AS SHOWN													
Checked:														
Approved:														
					Sheet size: A2									





**Note -:**  
**Street light to be fixed on one side at every 35m interval**

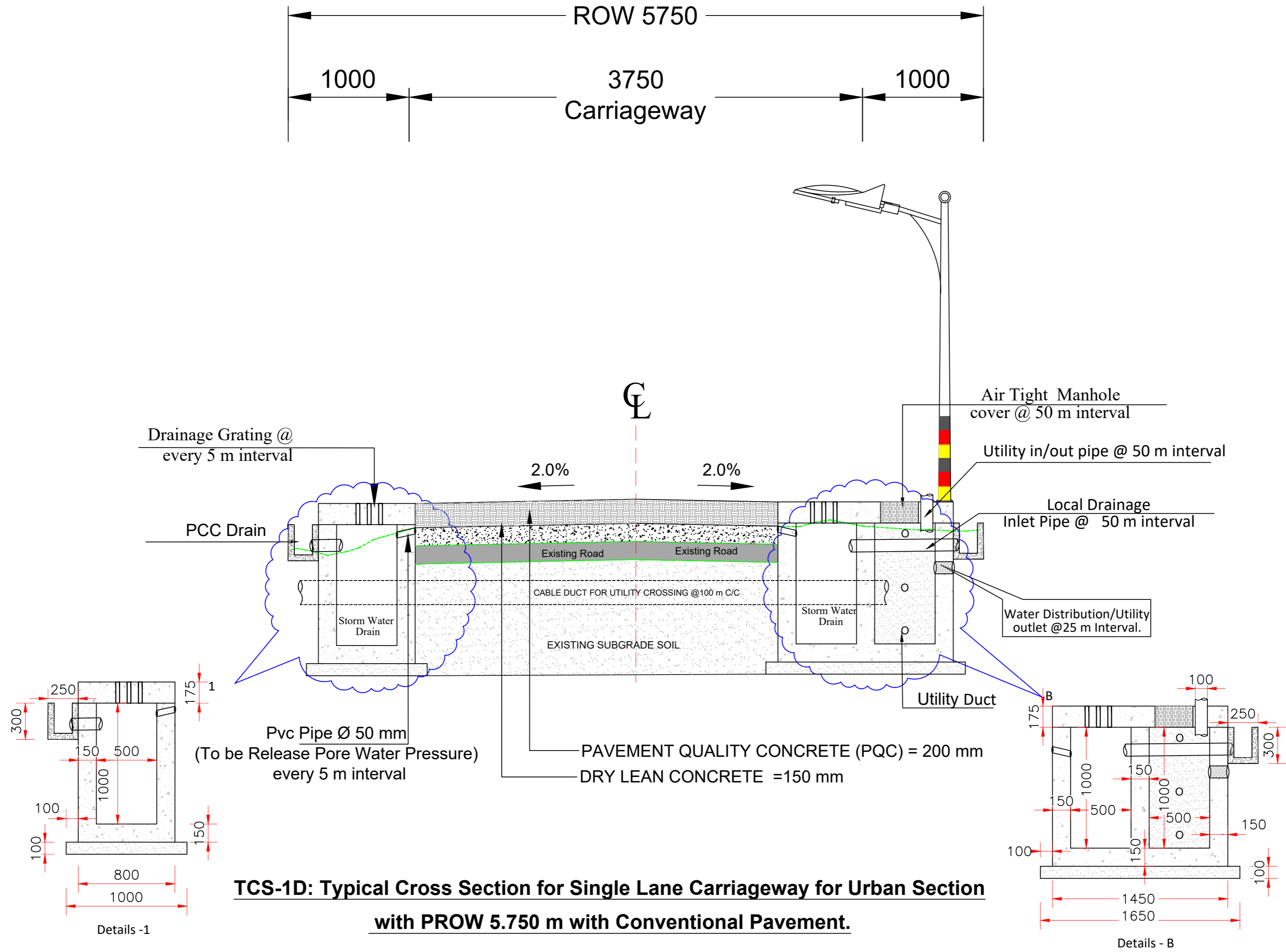
ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains
R0	March, 2023		 PUBLIC WORKS DEPARTMENT Government of Manipur	 <b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)	DRAFT DETAILED PROJECT REPORT	
					Designed: _____ Drawn: _____ Checked: _____ Approved: _____	Scale:-  AS SHOWN



**TCS-1C: Typical Cross Section for Single Lane Carriageway for Urban Section with PROW 5.750 m with Interlocking Concrete Block Pavement**

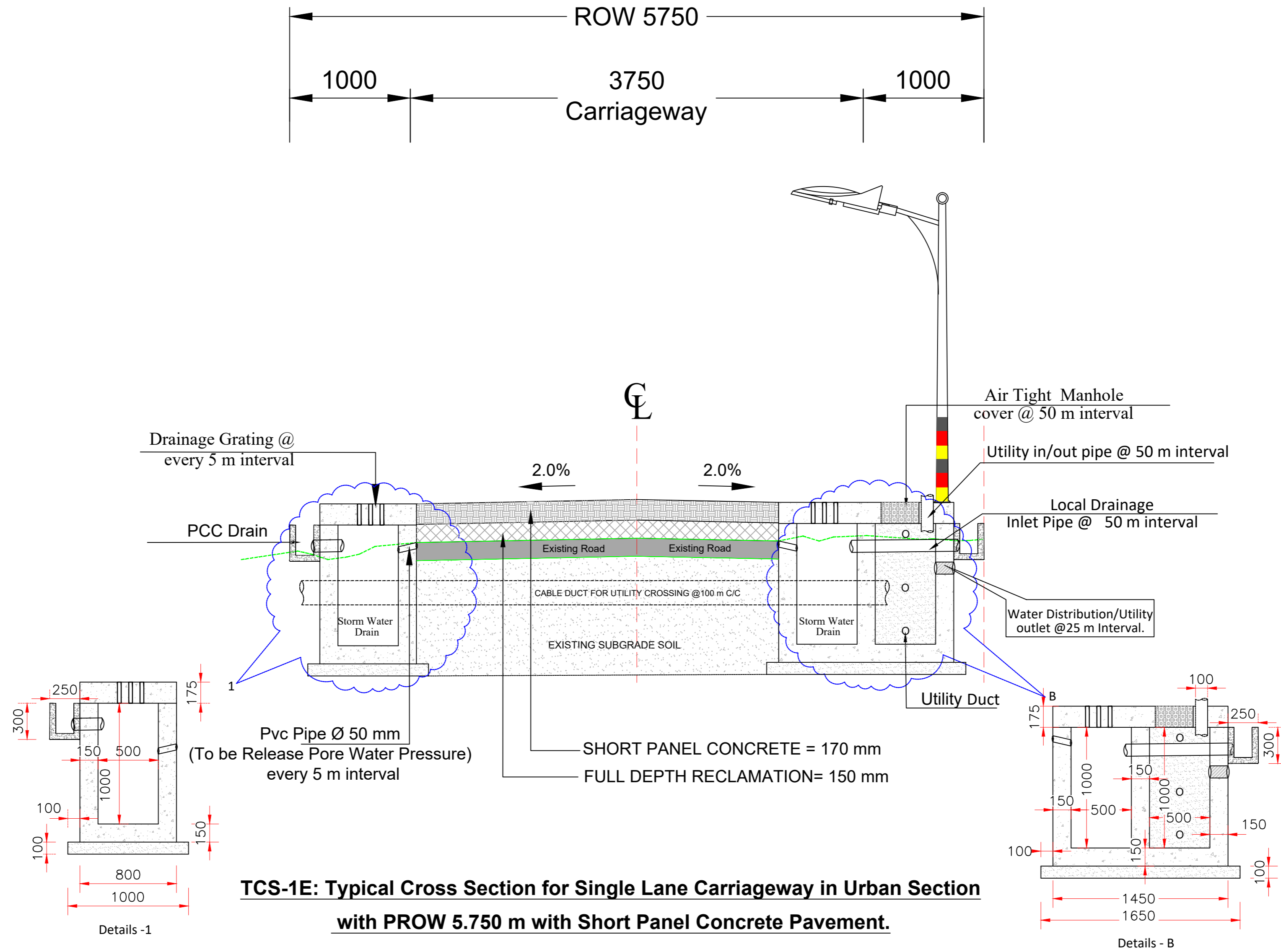
**Note -:**  
Street light to be fixed on one side at every 35m interval

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains							
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT								
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Drawn:	AS SHOWN												
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Approved:													
						Sheet size: A2	RC/1604/HO/HWB/RD/DWG/TCS/04/R0						





**Note :-  
Street light to be fixed on one side at every 35m interval**

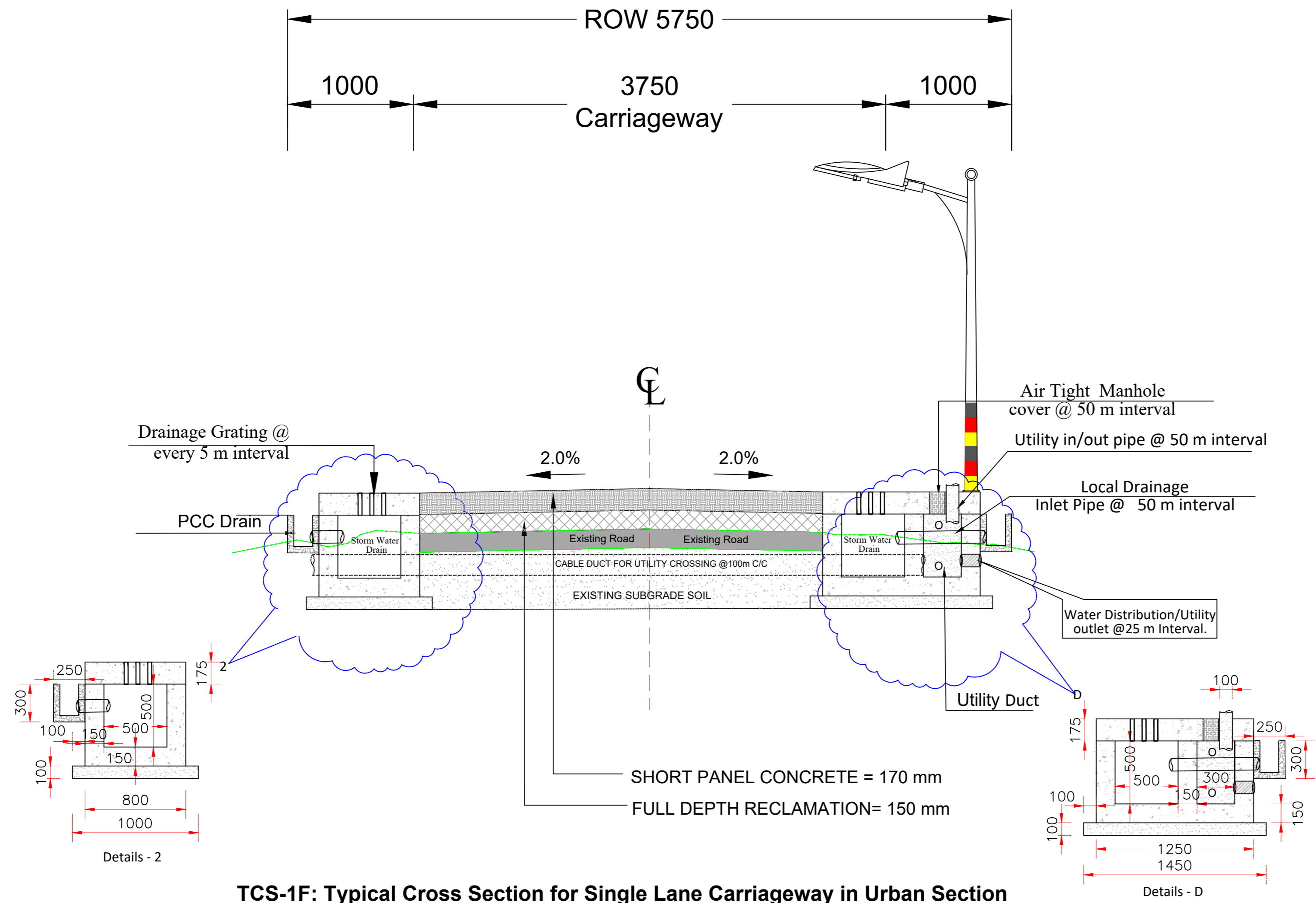
ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains							
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	Project							
						<table border="1"> <tr> <td>Designed:</td> <td>Scale:-</td> </tr> <tr> <td>Drawn:</td> <td>AS SHOWN</td> </tr> <tr> <td>Checked:</td> <td></td> </tr> <tr> <td>Approved:</td> <td></td> </tr> </table>	Designed:	Scale:-	Drawn:	AS SHOWN	Checked:		Approved:
Designed:	Scale:-												
Drawn:	AS SHOWN												
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Approved:													
					Sheet size: A2	RC/1604/HO/HWB/RD/DWG/TCS/05/R0							



**TCS-1E: Typical Cross Section for Single Lane Carriageway in Urban Section with PROW 5.750 m with Short Panel Concrete Pavement.**


**Note :-  
Street light to be fixed on one side at every 35m interval**

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT	Project	
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains
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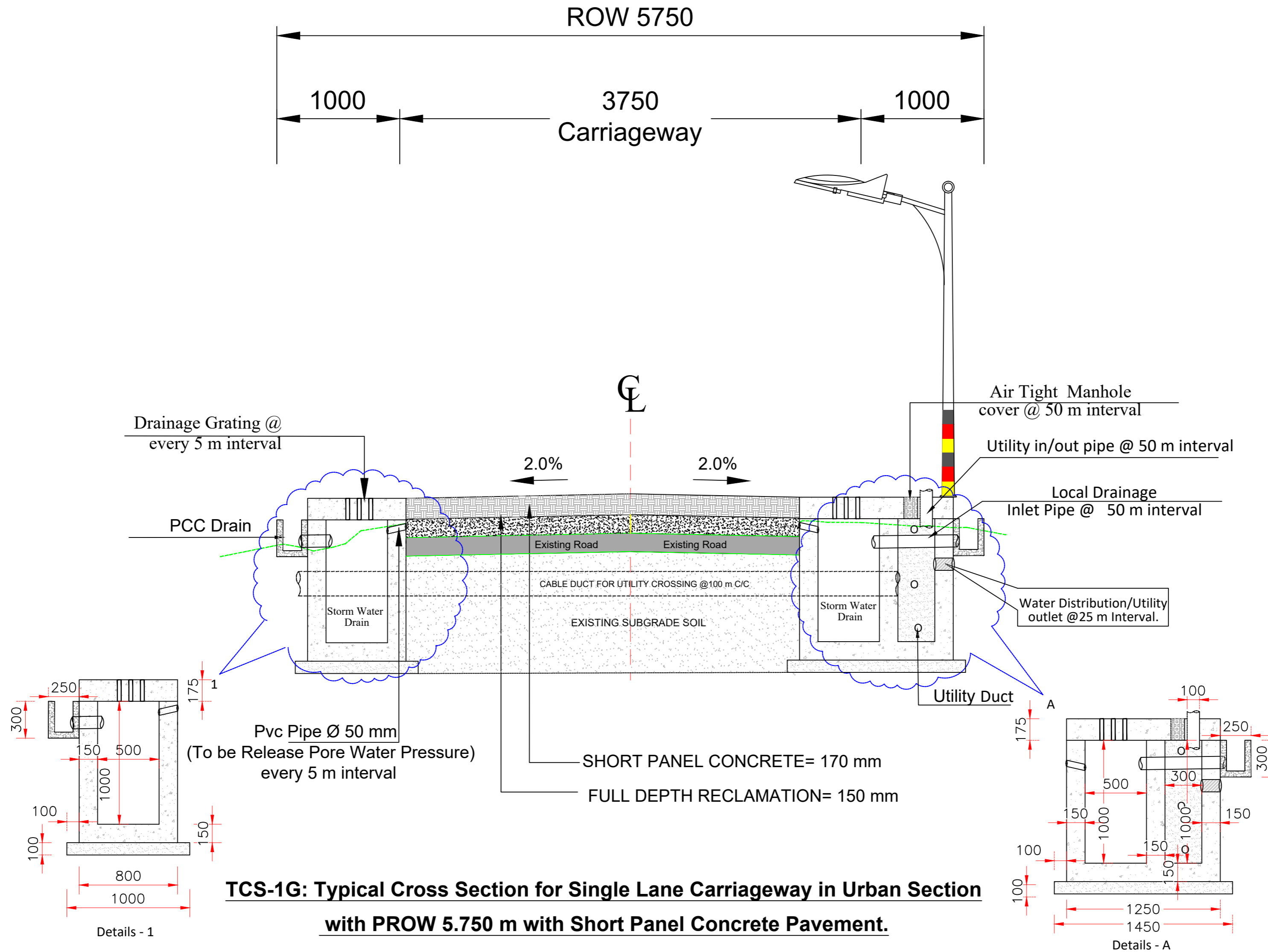


**TCS-1F: Typical Cross Section for Single Lane Carriageway in Urban Section with PROW 5.750 m with Short Panel Concrete Pavement.**

**Note -:**  
**Street light to be fixed on one side at every 35m interval**

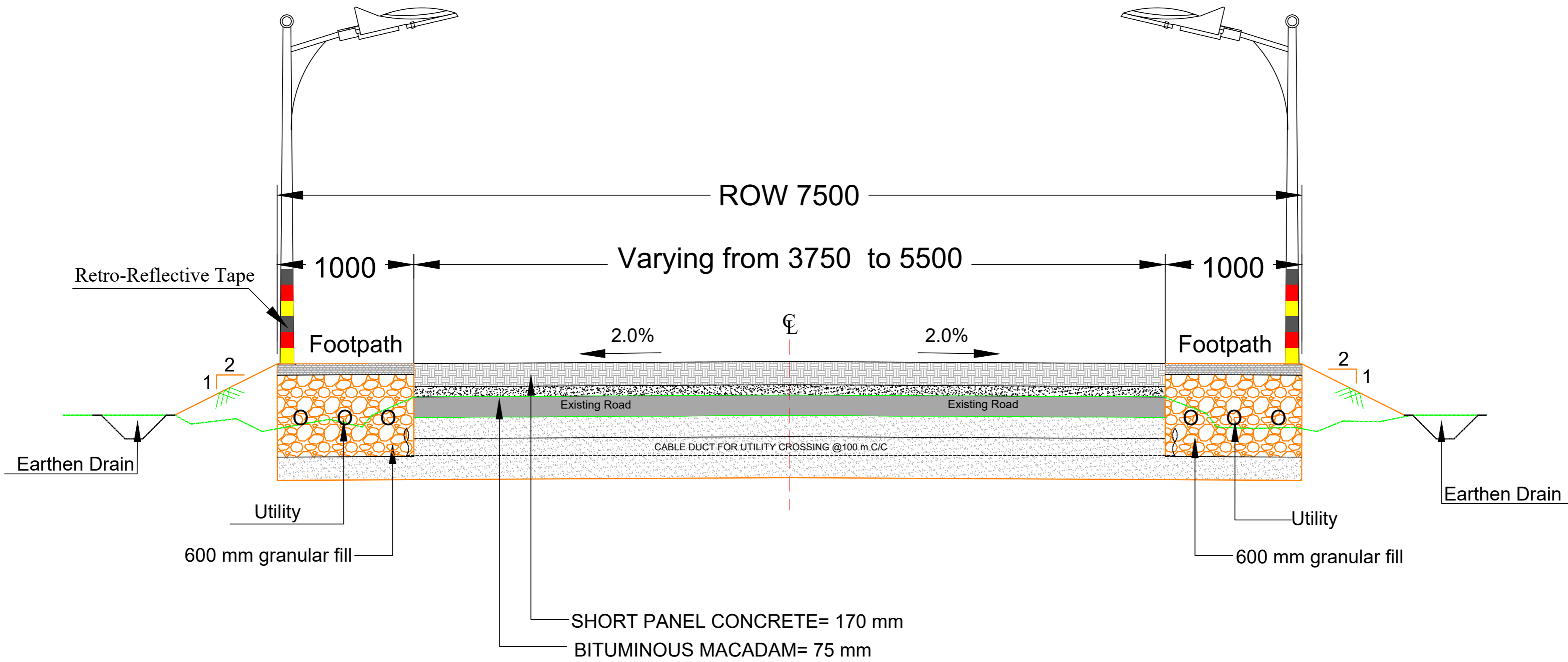
ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project							
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains						
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Drawn:	AS SHOWN											
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Approved:												
					Sheet size: A2	RC/1604/HO/HWB/RD/DWG/TCS/07/R0						






**Note -:**  
Street light to be fixed on one side at every 35m interval

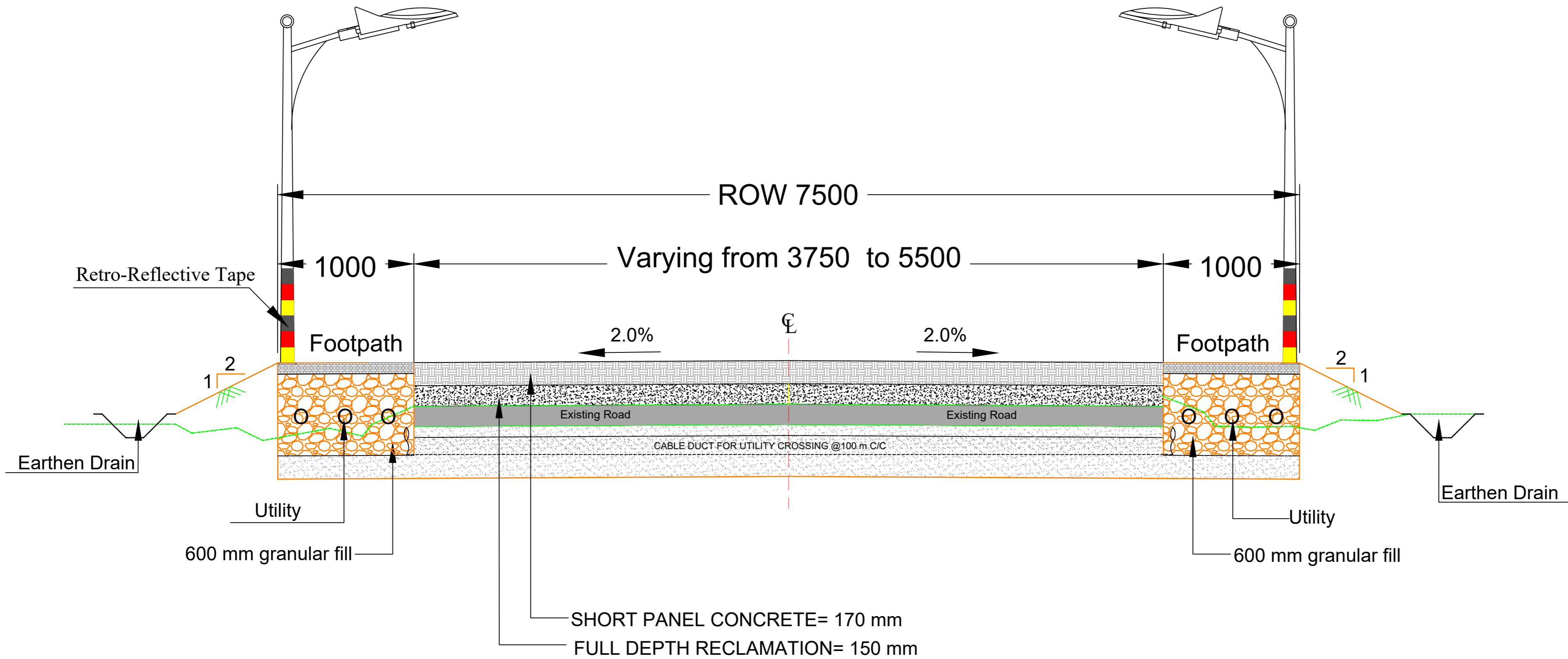
ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains							
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	Project							
						<table border="1"> <tr> <td>Designed:</td> <td>Scale:-</td> </tr> <tr> <td>Drawn:</td> <td>AS SHOWN</td> </tr> <tr> <td>Checked:</td> <td></td> </tr> <tr> <td>Approved:</td> <td></td> </tr> </table>	Designed:	Scale:-	Drawn:	AS SHOWN	Checked:		Approved:
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Drawn:	AS SHOWN												
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						Sheet size: A2	RC/1604/HO/HWB/RD/DWG/TCS/07/R0						



**TCS-2: Typical Cross Section for Single Lane / Intermediate Lane Carriageway for Open Area with PROW 7.500 m with Cement Treated Base and Subbase.**


**Note -:**  
**Street light to be fixed in staggered arrangement at every 35m interval**

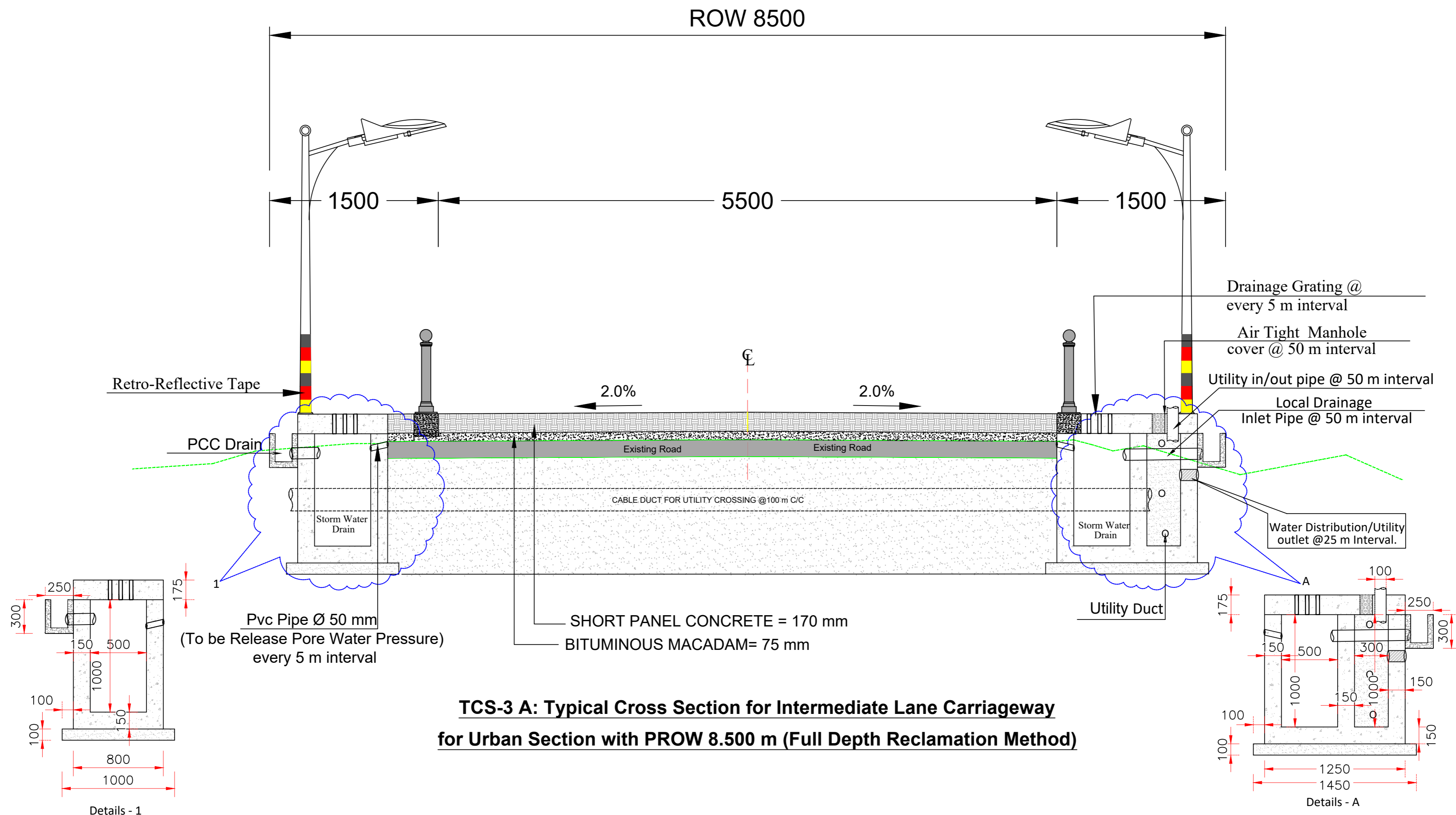
ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains	
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	Project	
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					Drawn: _____		
					Checked: _____		
					Approved: _____		Sheet size: A2
						RC/1604/HO/HWB/RD/DWG/TCS/08/R0	





**TCS-2A: Typical Cross Section for Single Lane / Intermediate Lane Carriageway for Open Area with PROW 7.500 m with Cement Treated Base and Subbase.**

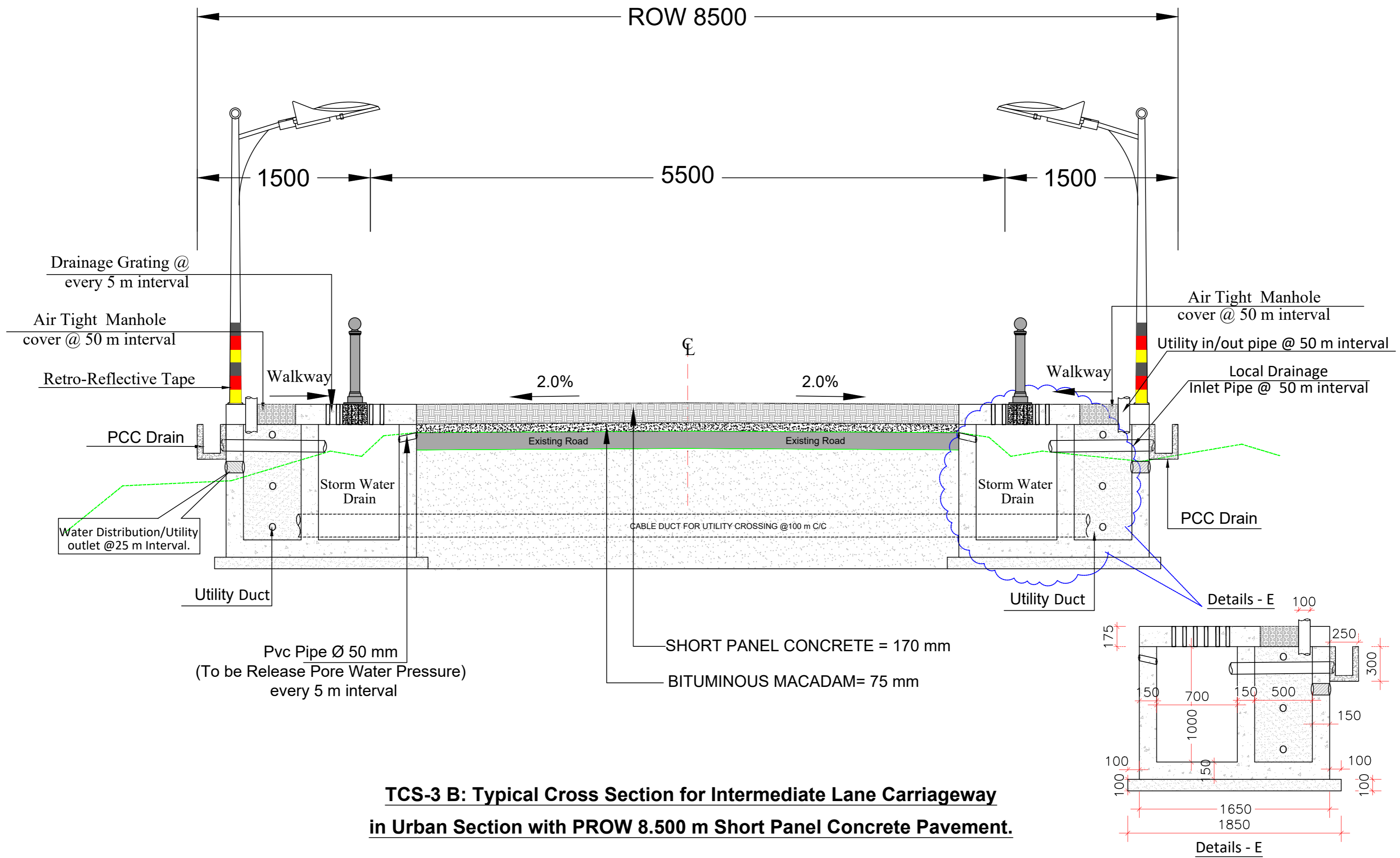
**Note -:**  
Street light to be fixed in staggered arrangement at every 35m interval

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains	
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	Project	
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					Checked:		
					Approved:		



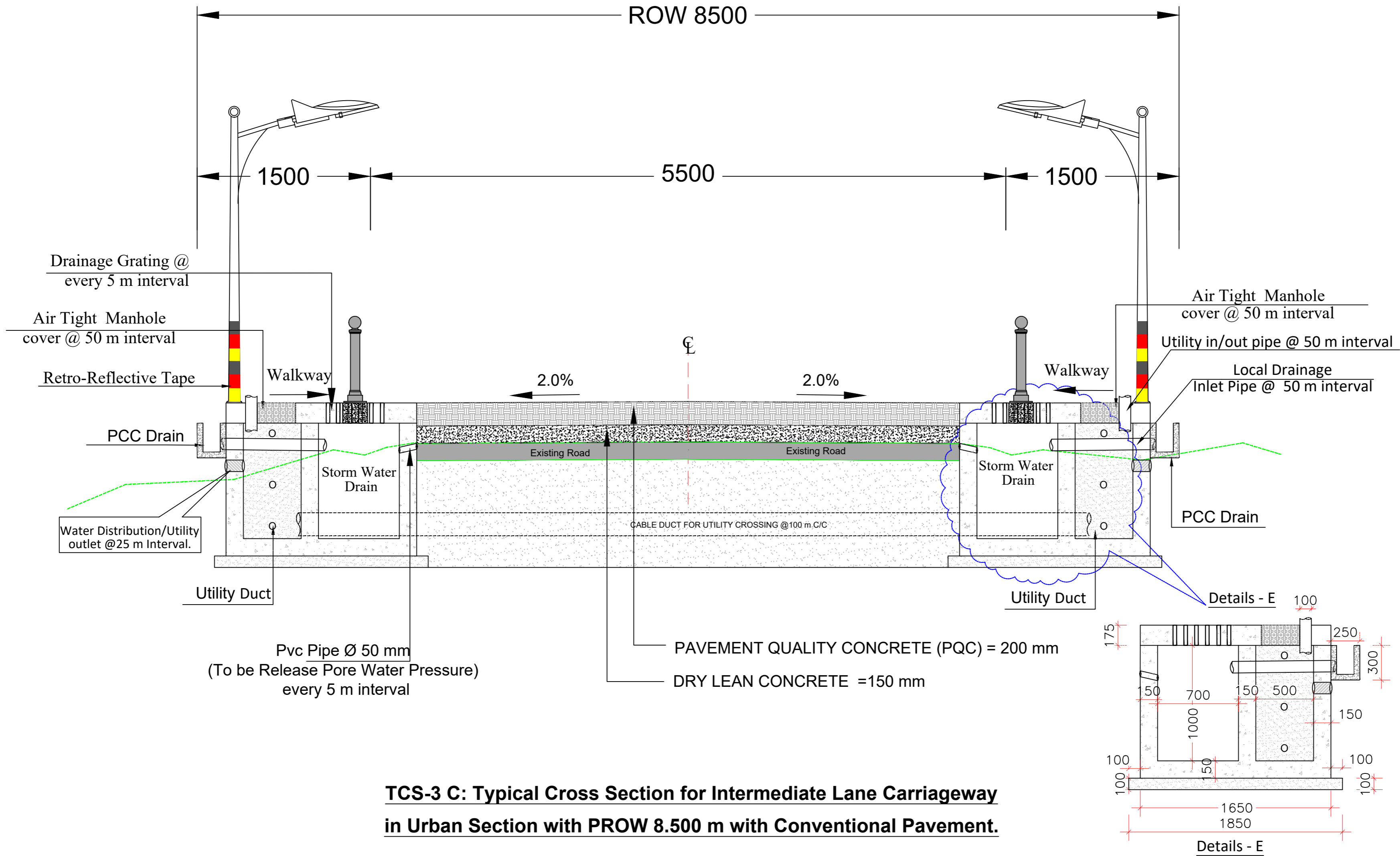
**Note :-  
Street light to be fixed in staggered arrangement at every 35m interval**

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	DRAFT DETAILED PROJECT REPORT	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains
R0	March, 2023		 PUBLIC WORKS DEPARTMENT Government of Manipur	 <b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)	Designed:	Scale:-	Drawing Title
					Drawn:	AS SHOWN	TYPICAL CORSS SECTION
					Checked:	Sheet size: A2	RC/1604/HO/HWB/RD/DWG/TCS/09/R0
					Approved:		



**Note -:**  
**Street light to be fixed in staggered arrangement at every 35m interval**

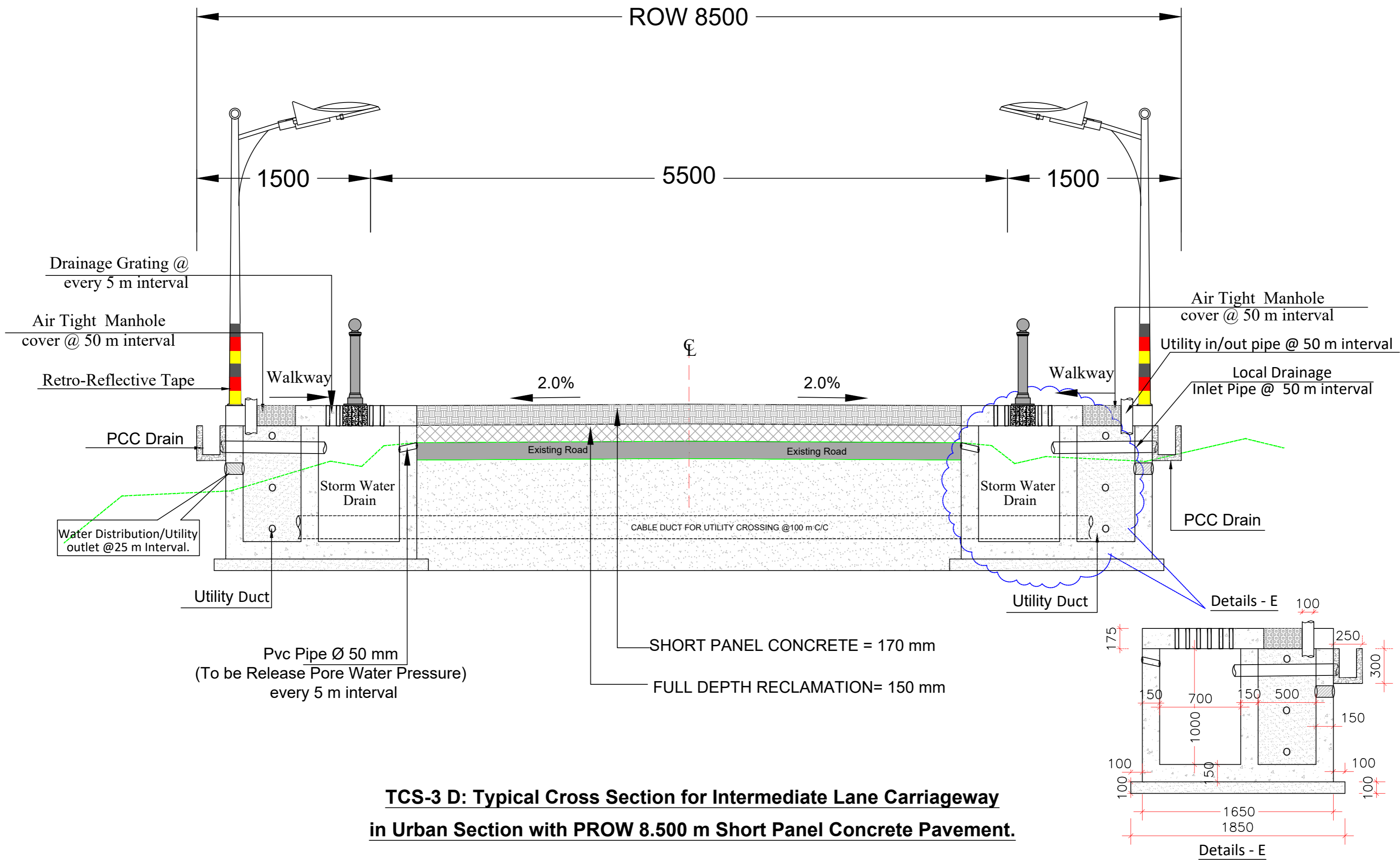
ISSUE	DATE	AMENDMENT \ ISSUE DESCRIPTION	CLIENT	CONSULTANT	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains							
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT		Project						
					<table border="1"> <tr> <td>Designed:</td> <td>Scale:-</td> </tr> <tr> <td>Drawn:</td> <td>AS SHOWN</td> </tr> <tr> <td>Checked:</td> <td></td> </tr> <tr> <td>Approved:</td> <td></td> </tr> </table>	Designed:	Scale:-	Drawn:	AS SHOWN	Checked:		Approved:	
Designed:	Scale:-												
Drawn:	AS SHOWN												
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Approved:													
					Sheet size: A2	RC/1604/HO/HWB/RD/DWG/TCS/10/R0							



**TCS-3 C: Typical Cross Section for Intermediate Lane Carriageway in Urban Section with PROW 8.500 m with Conventional Pavement.**

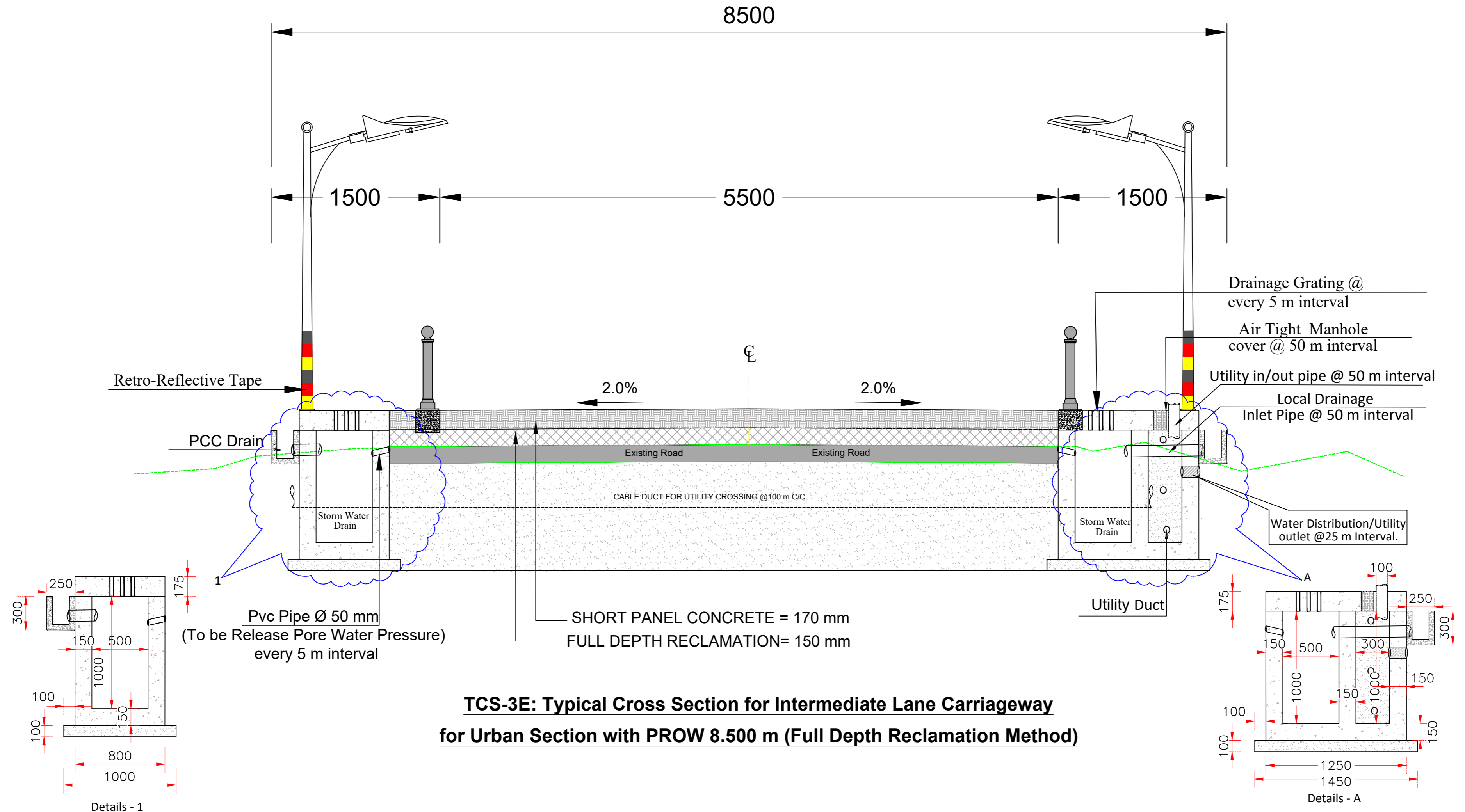
**Note -:**  
**Street light to be fixed in staggered arrangement at every 35m interval**

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains	
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	Scale:-	
						AS SHOWN	Drawing Title
					Sheet size: A2	RC/1604/HO/HWB/RD/DWG/TCS/11/R0	



**Note :-  
Street light to be fixed in staggered arrangement at every 35m interval**

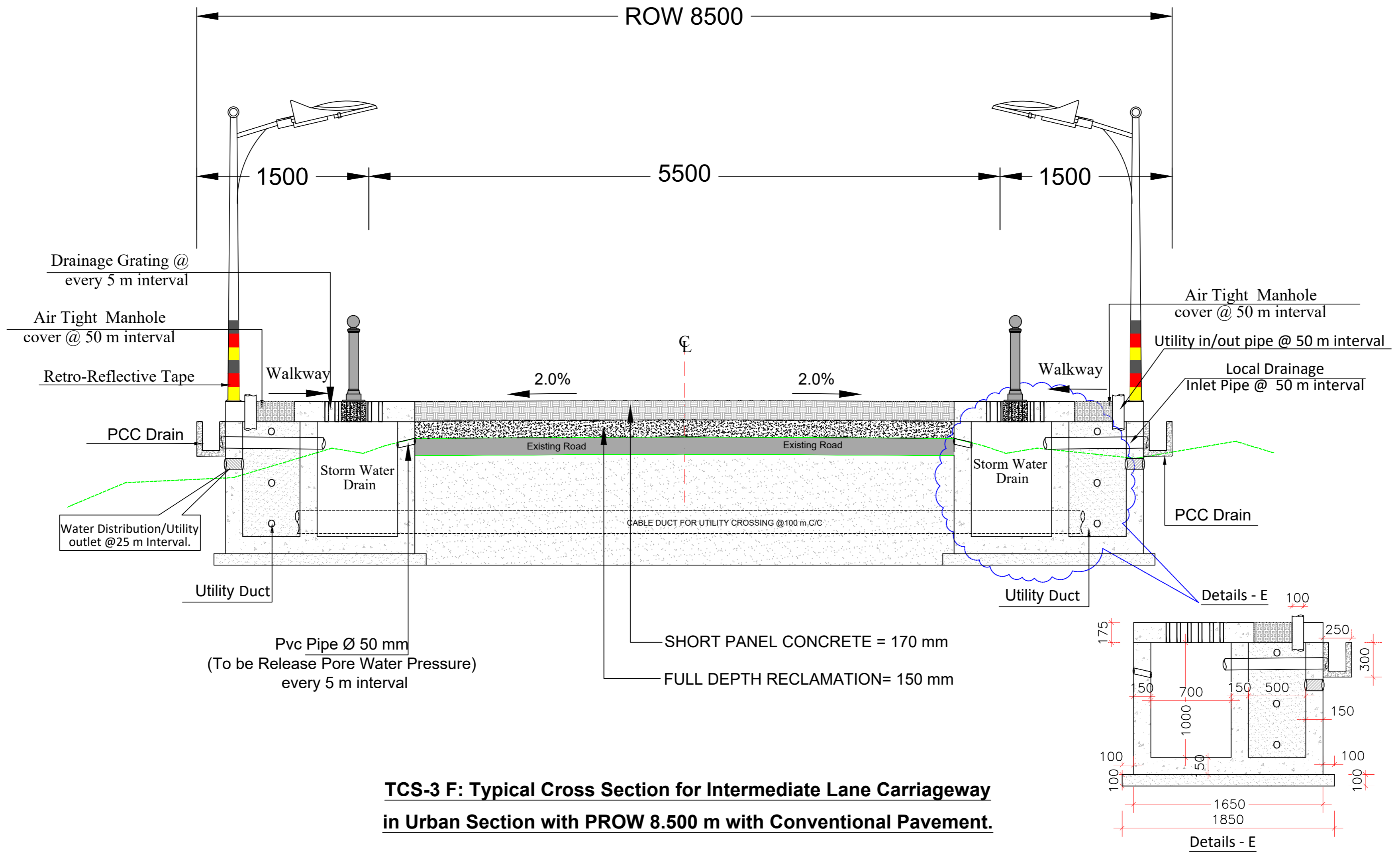
ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT	Project	Project Details
R0	March, 2023		 PUBLIC WORKS DEPARTMENT Government of Manipur	 RODIC CONSULTANTS PVT. LTD. 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)	DRAFT DETAILED PROJECT REPORT  Scale:- AS SHOWN	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains
						 PUBLIC WORKS DEPARTMENT Government of Manipur



**Note :-  
Street light to be fixed in staggered arrangement at every 35m interval**



ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project	Project
R0	March, 2023		 PUBLIC WORKS DEPARTMENT Government of Manipur	 <b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)	DRAFT DETAILED PROJECT REPORT	
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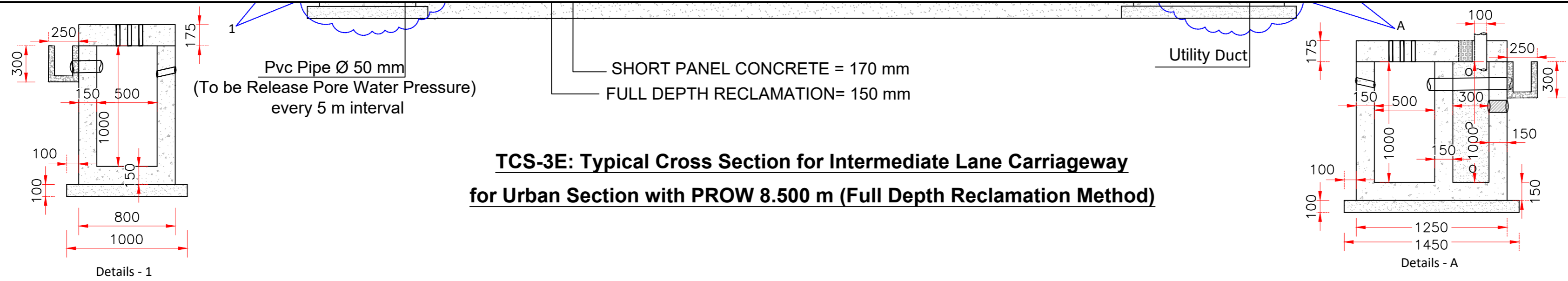




**TCS-3 F: Typical Cross Section for Intermediate Lane Carriageway in Urban Section with PROW 8.500 m with Conventional Pavement.**

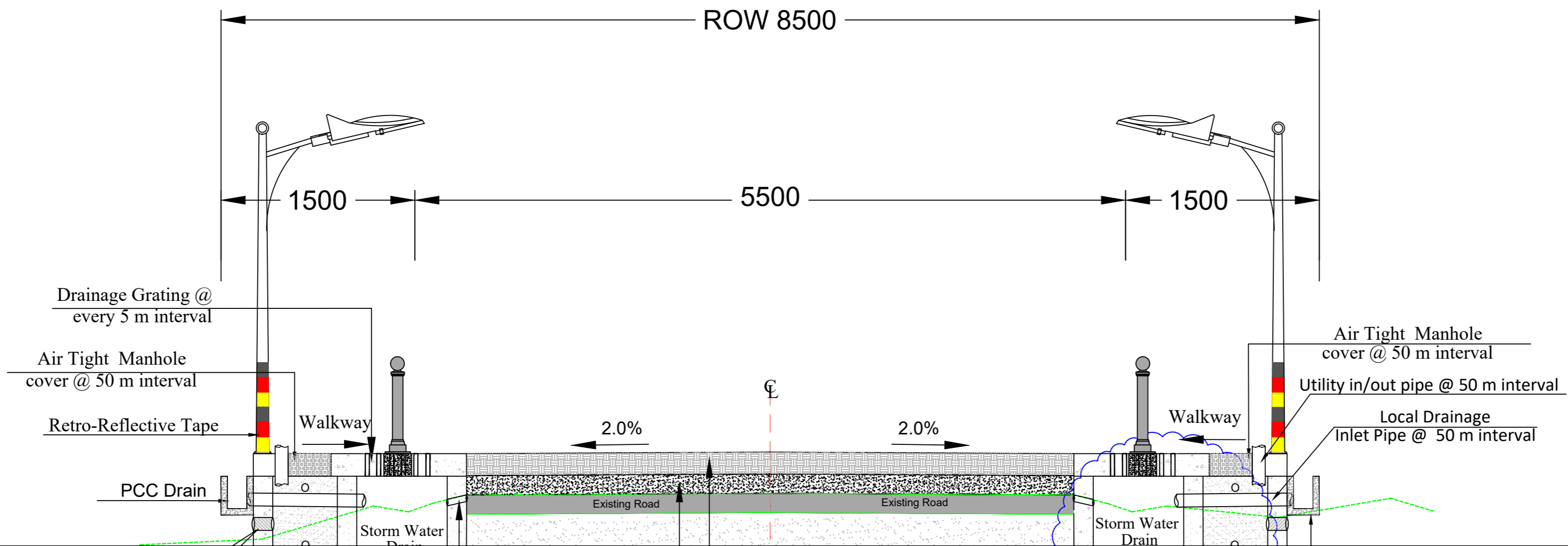
**Note :-**  
**Street light to be fixed in staggered arrangement at every 35m interval**

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project						
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b>                      1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING                      NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT						
					<table border="1"> <tr> <td>Designed:</td> <td>Scale:-</td> </tr> <tr> <td>Drawn:</td> <td>AS SHOWN</td> </tr> <tr> <td>Checked:</td> <td></td> </tr> <tr> <td>Approved:</td> <td></td> </tr> </table>	Designed:	Scale:-	Drawn:	AS SHOWN	Checked:	
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			<p>Drawing Title: <b>TYPICAL CORSS SECTION</b></p>								
			<p>Sheet size: A2 <b>RC/1604/HO/HWB/RD/DWG/TCS/12/R0</b></p>								

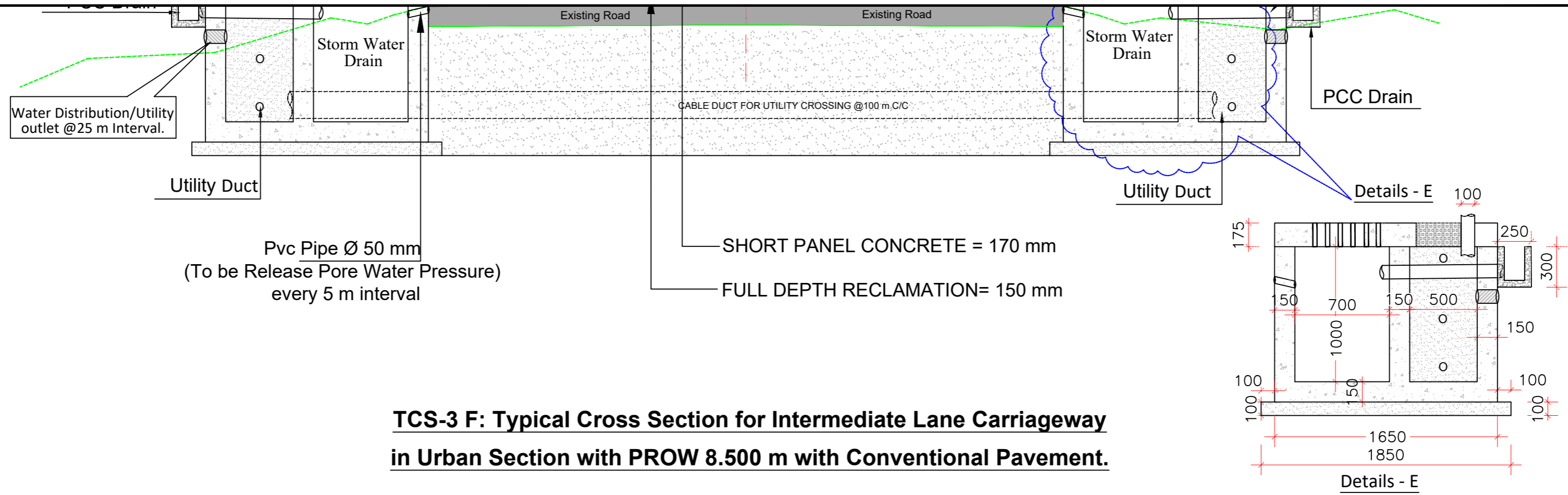


**TCS-3E: Typical Cross Section for Intermediate Lane Carriageway for Urban Section with PROW 8.500 m (Full Depth Reclamation Method)**

**Note -:**  
**Street light to be fixed in staggered arrangement at every 35m interval**

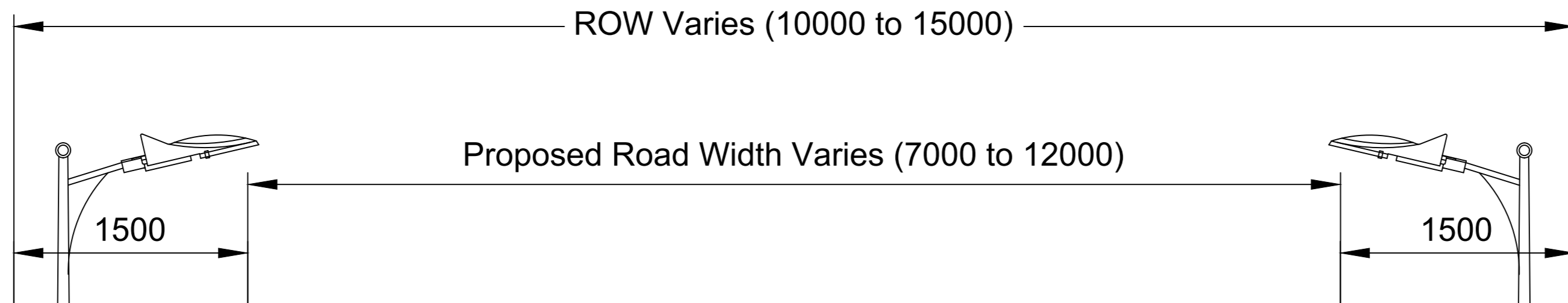


ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project	Scale:-	Drawing Title
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	AS SHOWN	TYPICAL CORSS SECTION
							Sheet size: A2

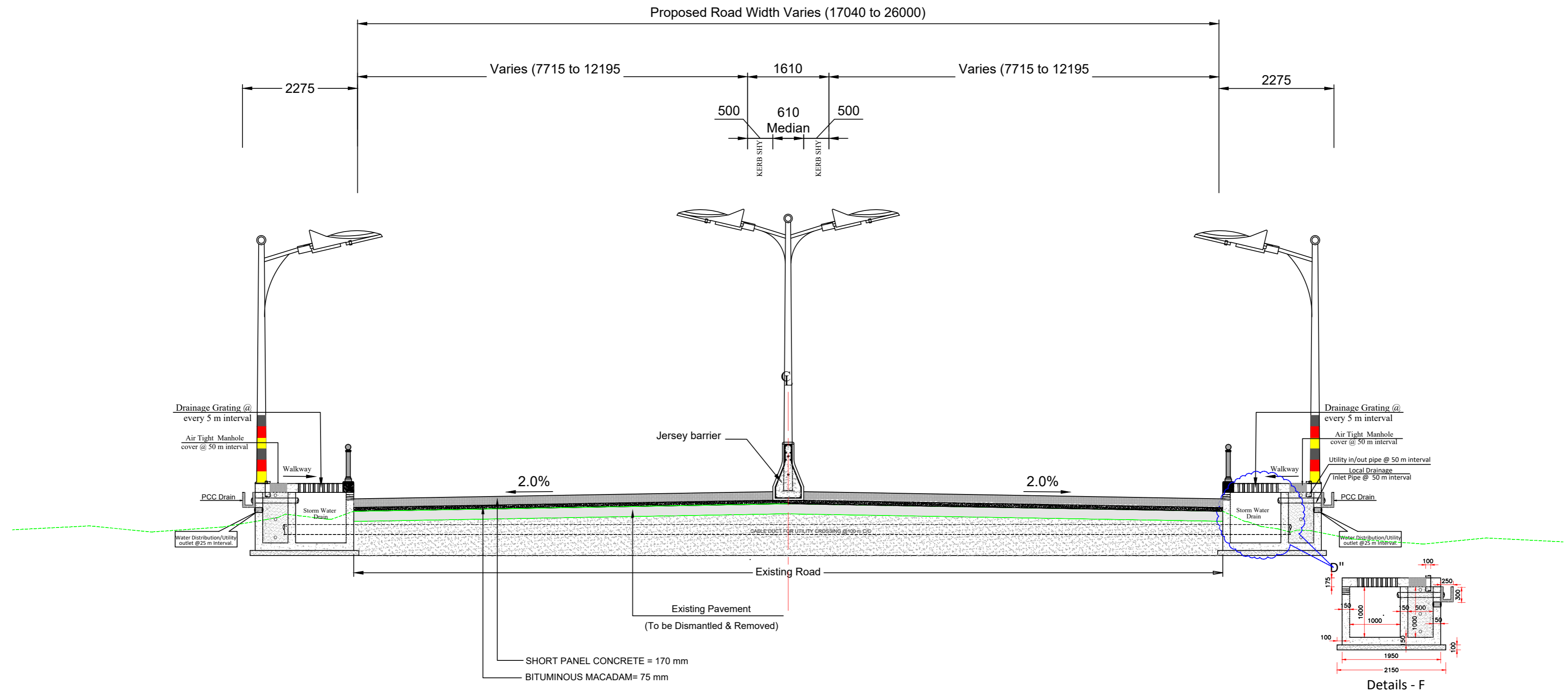


**TCS-3 F: Typical Cross Section for Intermediate Lane Carriageway in Urban Section with PROW 8.500 m with Conventional Pavement.**

**Note -:**  
**Street light to be fixed in staggered arrangement at every 35m interval**



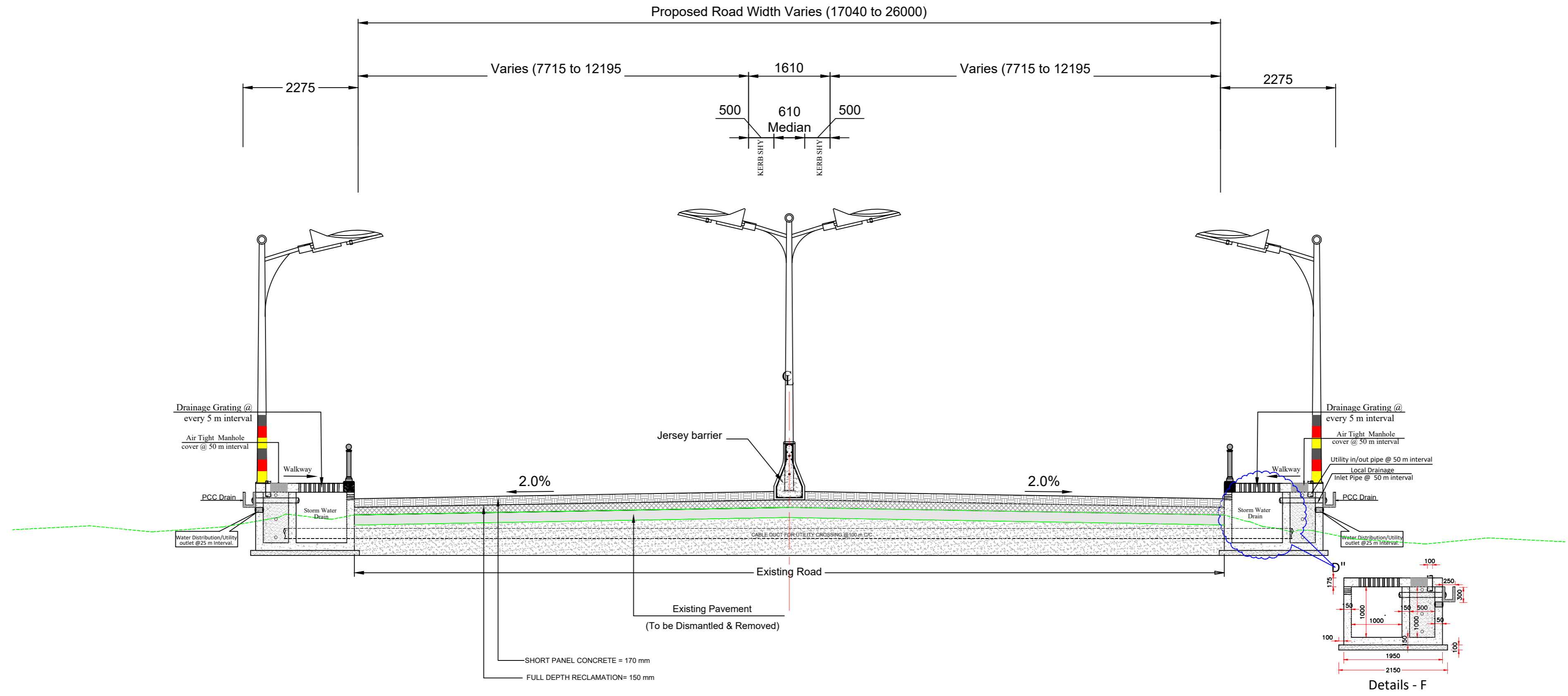
ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains							
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT		Project						
					<table border="1"> <tr> <td>Designed:</td> <td>Scale:-</td> </tr> <tr> <td>Drawn:</td> <td>AS SHOWN</td> </tr> <tr> <td>Checked:</td> <td></td> </tr> <tr> <td>Approved:</td> <td></td> </tr> </table>	Designed:	Scale:-	Drawn:	AS SHOWN	Checked:		Approved:	
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					Sheet size: A2	RC/1604/HO/HWB/RD/DWG/TCS/14/R0							



**TCS-5: Typical Cross Section for Four Lane Divided Carriageway in Urban Section with PROW 21.600 m with Short Panel Concrete Pavement.**


**Note :-**  
Street light to be fixed on both side at every 35 m interval

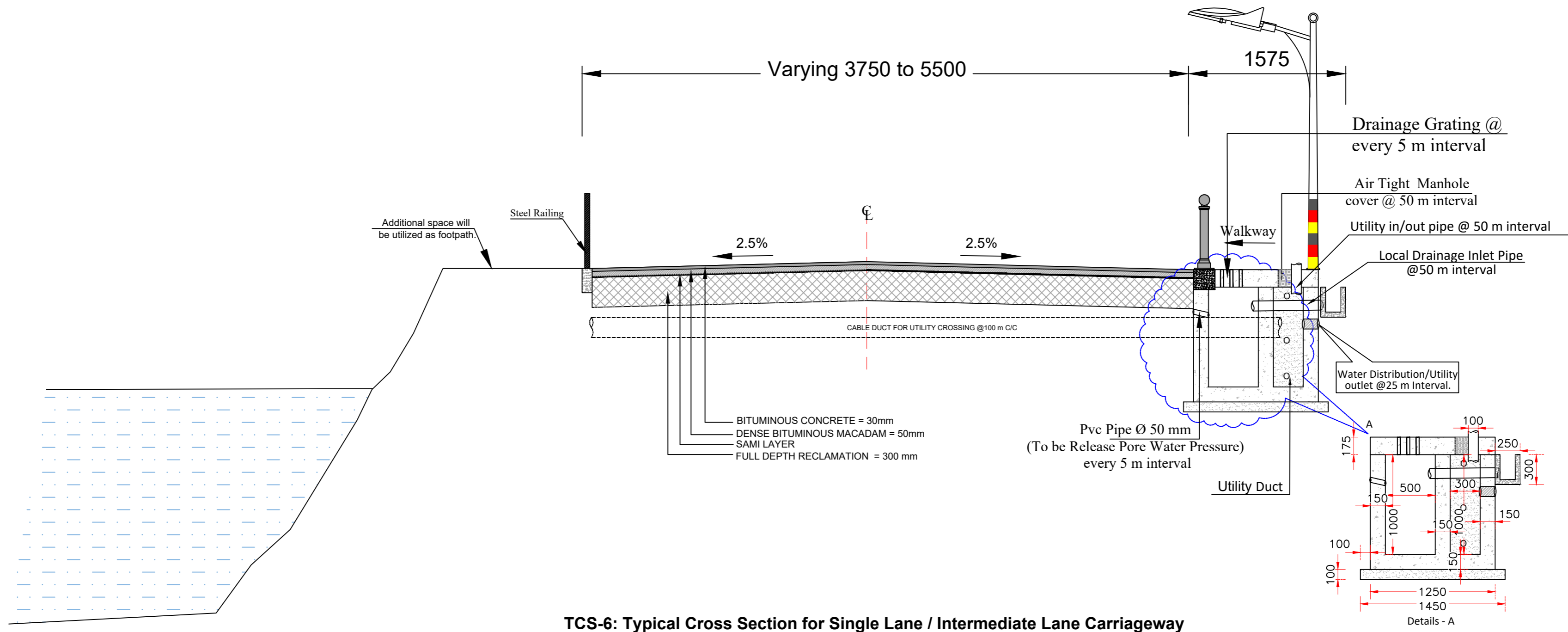
ISSUE	DATE	AMENDMENT \ ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains							
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT								
					<table border="1"> <tr> <td>Designed:</td> <td>Scale:-</td> </tr> <tr> <td>Drawn:</td> <td>AS SHOWN</td> </tr> <tr> <td>Checked:</td> <td></td> </tr> <tr> <td>Approved:</td> <td></td> </tr> </table>	Designed:	Scale:-	Drawn:	AS SHOWN	Checked:		Approved:	
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Drawn:	AS SHOWN												
Checked:													
Approved:													
						Sheet size: A2	RC/1604/HO/HWB/RD/DWG/TCS/15/R0						



**TCS-5A: Typical Cross Section for Four Lane Divided Carriageway in Urban Section with PROW 21.600 m with Short Panel Concrete Pavement.**

**Note :-**  
Street light to be fixed on both side at every 35 m interval

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT	Project	Drawing Title	
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains	
						AS SHOWN	TYPICAL CORSS SECTION
					Sheet size: A2	RC/1604/HO/HWB/RD/DWG/TCS/16/R0	



**TCS-6: Typical Cross Section for Single Lane / Intermediate Lane Carriageway for sections along Riverbank. (Flexible Pavement with FDR Method)**

**Note -:**  
Street light to be fixed on one side at every 35m interval

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION	CLIENT	CONSULTANT:	Project		
R0	March, 2023		 <p>PUBLIC WORKS DEPARTMENT Government of Manipur</p>	 <p><b>RODIC CONSULTANTS PVT. LTD.</b> 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)</p>	DRAFT DETAILED PROJECT REPORT	Project  Drawing Title Sheet size: A2	<p><b>Consultancy Services for Feasibility Study and Preparation of DPR for Improvement of Roads within Imphal City with Rigid Pavement including Concrete Lined Drains</b></p> <p>TYPICAL CORSS SECTION</p> <p>RC/1604/HO/HWB/RD/DWG/TCS/17/R0</p>

***ANNEXURE - 2 - ACCOMMODATION/LABOUR  
CAMP MANAGEMENT PLAN***

## ACCOMMODATION/LABOUR CAMP MANAGEMENT PLAN

### 1. INTRODUCTION

The Accommodation Camp Management Plan (ACMP) is the siting, development, management and restoration of accommodation camps to avoid or mitigate impacts on the environment. The area requirement for the accommodation camp shall depend upon the size of work, number of labourers Employed. The plan describes the siting, construction, maintenance, provision of facilities in the accommodation camps and finally their rehabilitation.

The purpose of the plan to develop by contractor is to set out the objectives and measures to maintain and enhance environmental performance of the quarries and borrow areas while avoiding to the extent practical, remedying, and mitigating any potential adverse environmental effects associated with quarrying and borrow area operations.

### 2. OBJECTIVE & SCOPE

The ACMP developed for management of Accommodation camp is applicable for effective management of workmen accommodation camp at construction site only.

The purpose of this Standard is to ensure that the workforce across the project is provided with an adequate standard of accommodation which meets specification establishes the construction & welfare requirements for the Workmen Habitat. It covers, area requirements for the various facilities of the habitat, i.e, Contractor shall always undertake best management practices (BMPs) to ensure that the construction and development activities do not cause any adverse impact on the environment and population in nearby area. The objective of the plan is:

- To adopt mitigation measures to prevent any adverse impact on Environmental attributes (air, water, soil, noise etc.)
- Ensure that the implementation measures are adopted
- Establish systems and procedures for this purpose
- Monitor the effectiveness of mitigation measures and
- Take any necessary action when unforeseen impact occurs.

### 3. LEGISLATIVE AND REGULATORY REQUIREMENTS

Contractor shall comply with all applicable regulations required for establishment and compliance of Plans. Contractor shall take all necessary applicable clearances from concerned authorities required under regulatory provisions.

- IS Code IS 10500:2012 – Drinking water specification
- ILO recommendations R 115 Workers Housing recommendation 1961
- Building and Other Construction Work act 1996 and rules 2006
- Indian Electricity rules 1956

Contractor shall comply with legislative and regulatory requirement as applicable

### 4. SITE SELECTION CRITERIA

Identification of site for construction and labour camps is the first task. Contractor shall identify the site for accommodation camp in within ROW and if outside ROW, consultation with individual owners (in case of private lands) and the concerned department in case of Government lands. The suitable sites shall be selected and finalized in consultation with the Engineer in-charge. Table below gives site selection criteria for setting-up accommodation camps.



Avoid the Following.....	Prefer the Following.....
X Lands within 500 m from nearby inhabitations	✓ Land available within ROW with minimum distance of 500 m from inhabitation
X Irrigated agricultural land	✓ land with no or less vegetation
X Land under village forest	✓ land away from water courses and if outside ROW,
X Land within 100 m of community water bodies and water resources	✓ minimum distance of 500 m from inhabitation
X Land within 100 m of water courses	✓ Waste land belonging to owners willing to give their land
X Low lying land	✓ Community land or Govt. land which is not being used for beneficial purposes
X Land supporting dense vegetation	✓ Private Land where owner is willing to give their land
X Grazing land and land with tenure rights	✓ Land with no/less vegetation cover and with existing access roads

Contractor shall work out arrangements for setting up construction and labour camps. These shall include and clearly specifying the:

- Photograph of the proposed Camp site in original condition
- Activities to be carried out at site
- Detailed layout plan for development of the labour camp that shall indicate the various structures to be constructed in the camp including temporary, drainage and other facilities.

Besides this, Contractor shall submit the list of all existing labor camp to the Engineer and list will be updated periodically as per the construction progress and update the list.

## 5. FACILITIES TO BE PROVIDED

Contractor shall provide free of cost at the camp site, temporary living accommodation to all the workers employed during construction work period. The rooms of labour shall be well lighted and ventilated. Following facilities shall be provided at the labour camp:

### A) Drinking Water

Towards the provision and storage of drinking water at the accommodation camp, Contractor shall ensure the following provisions :

- Sufficient supply of potable water in the camps, in overhead tanks or any other suitable containers.
- The drinking water to be supplied shall meet the requirement as per IS 10500. Regular testing of water quality shall be done as per IS 10500:2012.
- Drinking water points/tanks/containers/etc. in the camp are legibly marked "Drinking Water";
- Every water supply or storage shall be at a distance of not less than 15m from any wastewater / sewage drain or other source of pollution.
- Criteria for location of drinking water storage tanks in the camps as well as other provisions to secure them from getting polluted;
- Provision of regular cleaning of water tanks in the camps;
- Provision of arrangement in the labour camp for providing cold drinking water in hot summer
- Water sources within 15m proximity of toilet, drain or any source of pollution will not be used as a source of drinking water in the project.
- All tanks used for the storage of drinking water shall be covered as to prevent water stored therein from becoming polluted or contaminated. Provisions on practices to be

observed in the camps on "Water Conservation".

B) Washing and bathing facilities

At every construction site, Contractor shall provide adequate and suitable facilities for washing clothes and utensils and maintained for use of contract labour Employed therein. Separate and adequate bathing shall be provided for the use of male and female workers. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic conditions.

- Provision on arrangement of drainage for draining away wastewater from key locations such as washing clothes area, hand washbasins, utensils washing in kitchen, bathing area, etc.;
- Provisions of wastewater handling system to be provided on each camp site;
- Provision of storage facility for general water supply in the camp for washing clothes, bathrooms, kitchen, etc.;
- Criteria to be followed on the provision of sufficient bathroom facilities in accordance with the number of workers accommodated in the camp; and
- Provisions on practices to be observed in the camps on "Water Conservation"

C) Toilet facilities

Contractor shall provide Sanitary arrangements, latrines and urinals at every accommodation camp separately for male and female workers, as required. The arrangements shall include:

- Provision of sufficient toilet and urinal facilities in accordance with the number of workers accommodated in the camp shall be provided.
- Separate latrines for male and female
- Every latrine shall be under cover and so partitioned as to secure privacy, and shall have a proper door and fastenings.
- Where workers of both sexes are Employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers "For Men Only" or "For Women Only" as the case may be
- Provision of cleaning and re-equipping of these facilities on daily basis;
- Soak pits of adequate sizes shall be provided in the camp. Regular cleaning shall be done and sewerage disposal shall be done through vendors, if available.
- The latrines and urinals shall be adequately lighted and shall be maintained in a clean sanitary condition at all times and should have a proper drainage system.
- Water shall be provided in or near the latrines and urinals by storage in suitable containers.
- Hand washing facility should be installed outside toilets.

D) Waste Disposal

Contractor shall be completely responsible for collection of waste generated from labour camps, its temporarily storage and disposal through approved vendors. It shall be ensured that:

- Two different bins shall be provided in kitchen for collection of biodegradable and non-biodegradable waste temporarily and shall be disposed-off through approved vendors or to a municipal waste collection bin, if available nearby
- Necessary awareness on the same shall be provided to inmates of the camp.
- Temporarily Collection of sanitary waste and excreta shall be done in septic tanks of adequate capacity
- Later, they will be disposed-off through govt. approved vendors or in municipal sewers, if found nearby.
- Health & Environment training and awareness programs on waste management in the labour camp shall be conducted.
- Septic tanks shall be located at-least 15m from away from water body.
- The bottom of the pit shall be filled with coarse gravel and the sides shored up with

board, etc. to prevent erosion and collapse of the pit.

- The collection tank or septic tank once filled shall be Emptied or if not possible immediately, new collection tank shall be formed.
- Temporarily Collection of sanitary waste and excreta shall be done in septic tanks of adequate capacity
- Later, they will be disposed-off through approved vendors or in municipal sewers, if found nearby
- Soak pits shall be provided for collection of wastewater from kitchen.
- The collection bins shall be Emptied on regular basis.
- Plastic waste/Paper waste and other waste shall not be allowed to burn in open.

E) Cooking Area:

Adequate Cooking area shall be provided at labor camps, depending upon the number of workmen.

- Cooking area shall be kept clean and at regular intervals.
- Hand washing facility and utensil washing facilities shall be provided.
- It shall be ensured that the cooking area has adequate illumination and lighting to make it easier for cooking at nighttime. Waste collection bins shall be provided to collect food waste and other waste, being generated from cooking area.
- Proper ventilation shall be provided at cooking area.
- Regular monitoring shall be done to ensure that cooking area is kept clean and proper hygiene is maintained.
- Wood burning shall be avoided.

F) Medical and First aid facilities:

Contractor shall provide medical facilities to labors at site. Visit of doctor shall be arranged at regular intervals and routine check-ups shall be conducted for labors. A separate room for medical checkups and keeping of first aid facilities shall be built. A first aid box shall be provided at construction site and under the charge of SHE Engineer who shall always be readily available at site during working hours. He shall be adequately trained in administering first aid-treatment. Formal arrangement shall be prescribed to carry injured person or person suddenly taken ill to the nearest hospital. An ambulance shall always be made available at construction site for the same.

- Emergency Communication & Emergency Response Plan as mentioned in Project SHE Plan shall be followed for labour Camp.
- Awareness, training & information related to HIV/AIDS (through leaflets, booklets, posters, training, etc.) shall be provided to labors / inmates of the camp from time to time.

G) Fire-fighting arrangements

Contractor shall make all necessary fire-fighting arrangements at labour camps to avoid any major accidents due to fire. Following precaution shall be taken by contractor for ensuring fire safety at labor camp:

- Identification of area susceptible to fires with cautionary signage
- Portable fire extinguishers and/or sand baskets shall be provided at easily accessible locations in the event of fire
- Education and training shall be provided to labors and other workers for using fire-fighting equipment.
- Since labour camp is situated in close proximity to office establishment at different location of the project, Emergency Communication & Emergency Response Plan as mentioned in Project SHE Plan shall be followed for labour Camp.
- One assembly area shall be provided at each construction site

H) Safety & Security

Contractor shall ensure the security of all workers staying in labor camps, both during day and night time. A security guard shall be placed at site to ensure proper security at construction site and labor camp. Provision of fencing around campsite shall also be provided to ensure safety and security of workmen.

I) Insect and rodent control

- All areas should be kept free from insects, pests, and rodents. A pest control should be performed by an approved pest control operator at a regular basis and maintain the records for the same.
- Insect killers and/or suitable means of pest control should be installed
- Effective measures must be taken to prevent infestation by and harborage of animal or insect vectors or pests.
- The management should have contract with a Pest Control Company to carry out pest control program for the facility.

J) Illumination

- Lighting must be provided to all internal areas at a Minimum level of 150 Lux.
- All fixed lighting must be ceiling mounted.
- Suspended lighting is prohibited.
- Common outdoor recreational areas at a Minimum level of 50 Lux.
- Lighting of 300 Lux shall be maintained in the first aid center.

K) Correct Storage

The correct storage of goods is essential to reduce pest incidence. The following principles must be adhered to by occupiers and users of premises:

- All areas must remain accessible for cleaning and inspection, which should be carried out at frequent and regular intervals.
- Damage to storage containers must be minimized to reduce spillage.
- All goods must be kept clear of the walls, windows, and ventilators.
- All goods must be kept off the floor, taking care enough room is left to clear spillages.
- All areas must be well ventilated and lighted.
- Storage areas must be in good repair and effectively proofed against pest entry
- Storage space should be cleaned and inspected before new stock arrives.

## 6. OPERATION &amp; MAINTENANCE

Accommodation camps shall be maintained free from litter and in hygienic condition. It should be kept free from spillage of oil, grease or bitumen. Any spillage shall be cleaned immediately to avoid pollution of soil, water stored or adjacent water bodies. The following precautions shall be taken in accommodation camps:

- Measures to ensure that no leaching of oil and grease into water bodies or underground water takes place.
- Waste water shall not be disposed into water bodies
- Regular collection of solid wastes shall be undertaken and should be disposed-off safely
- All consumables as the first aid equipment, cleaning equipment for maintaining hygiene and sanitation should be recouped immediately
- No water stagnation shall be allowed in the camp such as in ditches or ponds where mosquitoes can breed due to water accumulation;
- No waste shall be allowed to burn on camp sites;
- No general garbage shall be allowed to overflow from the bins and spreading around;
- No workers shall be allowed to cut surrounding vegetation for fuel purpose; and

- SHE Policy shall be displayed in local language in the labour campsite.

## 7. GOOD HOUSEKEEPING

- Despite all proofing precautions pests will inevitably get into a building at some time. However, there is a large difference between an occasional invader and the establishment of a stable population of certain pests.
- To reduce the risk of an infestation it is important to deny the lone invader the conditions it likes, and all occupiers and users must ensure that.
- Their rooms are clean and tidy to reduce sources of food and harbourage. Attention must be paid to locker rooms, changing, dining, stores, record stores, and waste compounds.
- Cooperation between occupiers, users and cleaners of premises and pest-control contractors is essential, to ensure baits are not moved, re-positioned, or washed away.
- Spillages are cleared away promptly.
- Food is kept in rodent proof containers; lids are always replaced.
- Food waste and other refuse shall be adequately deposited in sealable containers and removed from the kitchen frequently to avoid accumulation.
- Unused equipment, packaging, materials, leaflets, stores, and similar articles must be rotated and checked frequently as rodents prefer living in undisturbed areas.
- Special attention must be paid to waste disposal. Receptacles should be of adequate capacity to avoid overflowing and should be provided with tight fitting lids or covers.
- Waste must be removed promptly and efficiently, and refuse areas kept clean. Receptacles themselves must be cleaned after emptying to prevent deposits providing breeding sites for flies.

- The internal walkways are documented with hard standing material, kept free of any storage material/ obstructions, and maintained in a clean and tidy manner.
- A supervisor shall be appointed to supervise hygiene in the Habitat facilities.

## 8. SITE CLOSURE

At the completion of construction, all accommodation camp facilities shall be dismantled and removed from the site. The site shall be restored to a condition in no way inferior to the condition prior to commencement of the works. Contractor shall carry out required activities for site rehabilitation which include:

- Oil and fuel contaminated soil shall be removed and transported to govt. approved vendors and recyclers for final treatment/disposal.
- Soak Pits & Septic tanks shall be covered and effectively sealed off.
- Debris (rejected material) shall be disposed off suitably.
- Ramps created, if any should be levelled.
- Underground water tank in a barren/non-agricultural land can be covered. However, in an agricultural land, the tank shall be removed.
- If the accommodation camp site is on an agricultural land, topsoil can be spread so as to aid faster rejuvenation.
- Proper documentation of rehabilitation site is necessary. This shall include the following:
  - Photograph of rehabilitated site;
  - If camp site is outside ROW, Land owner consent letter for satisfaction in measures taken for rehabilitation of site;
  - Certification from Engineer in-charge.

## 9. INSPECTION AND MONITORING

Regular inspection of Workers accommodation shall be conducted by Contractor for effective implementation of management plan and mitigation measures to minimize the impact on environmental conditions.

Following practices shall be adopted to monitor the Environmental condition at ACMP:

- Visual Inspection of hygienic and aesthetic of camps
- Impact on air, water, noise, waste etc.
- Waste Management
- Monitoring records of env monitoring
- Monthly inspection by the contractor and submission it to PWD/PMC along with site photographs for review and necessary action
- Monitoring the environmental parameters (air, water, soil, noise) and quality as per the Environmental monitoring plan for the project.

## 10. PLAN IMPLEMENTATION

Contractor shall implement the ACPM to ensure that no adverse environmental impacts are envisaged. It shall be the responsibility of the SHE team to conduct site inspection as per the checklist developed for each management plan. It will be ensured that:

- All management plans and pollution prevention and control measures are successfully implemented at site
- Waste management of ACPM to be effectively implemented.
- Any observations made at site shall be recorded and reported to Chief SHE Officer
- All necessary actions have been taken at site to minimize any impact
- Any observations made by the engineer shall be reviewed and shall be compiled, if required

## 11. RECORDS KEEPING AND REPORTING

Contractor shall conduct monthly inspection of all identified accommodation camp in order to:

- Monitor the implementation of the control measures and to ensure the environmental impacts are being minimized.
- Ensure the requirements and inspection frequencies are being met.

Contractor shall monitor the management activity and keep the records of monitoring and routine inspection. It shall be ensured that:

- A register or similar records/routine checklist documents and records of all types and quantities of material excavated as well as where re-use or recycled material is being used and
- Inspections records are kept

Routine monthly inspection shall be done by contractor as per the checklist and any environmental issues associated with it shall be addressed as following:

- Any issues that are observed during inspection shall be conveyed to Chief SHE Officer and corrective measures shall be taken.
- Contractor at site shall send the monthly report to contractor, who will review the inspection report and forward the same to Chief SHE Officer.
- Contractor shall submit the inspection report as a part of the monthly report to the Engineer.
- Any suggestions, observations made by the engineer shall be addressed, if found necessary and shall submit the updated report.

Contractor shall ensure that following database must be documented for each identified accommodation camp that provides the basis of the redevelopment plan:

- Location of camps
- Distance from nearest habitation
- Map showing location and transportation/access routes
- Present usage of land
- Area (sq.m)
- Approximate quantity of material available
- Number of trees removed or to be removed
- Whether purchased or leased
- Photographs from all 4 sides
- Type and details of access routes

- Slope/drainage characteristics
- Existing land-use
- Any environmental or eco-sensitive issues, if any

## 12. TRAINING

Training shall be provided to site Engineers, supervisors and workmen at labor camp at site for effective management of Environment and to prevent/minimize environmental pollution at site. Training module shall be developed by Contractor in coordination from Contractor, Planning engineer and SHE staff. Contractor at site shall deliver the training to the Engineer and workmen at site. The topics to be covered in training shall include:

- Objective of training
- Site selection criteria
- Rules and Regulations/guidelines
- Basic requirement of accommodation camp
- Waste management, Housekeeping
- Preventive and mitigation measures adopted at site
- Do's & Don'ts
- Rehabilitation of camps
- Role & Responsibility of Individual
- Inspection & Monitoring
- Reporting

## 13. REVIEW

Contractor shall review the Plan if and when required. All regulatory and applicable guidelines shall be followed and required clearances shall be obtained.

He shall ensure that:

- If any non-compliance to the management plan is observed, Contractor shall review the same and shall take corrective measures to comply the same.
- Any observations made by the engineers shall be reviewed and shall be complied, if required.

## 14. GRIEVANCE REDRESSAL MECHANISM

Complaint associated with compulsory acquisition of land and property will be brought to notice to PWD and with mutual consultation with all parties involved, the issue will be amicably resolved through PWD Grievances/complaints on environmental matters are expected to be relatively few and straight forward so a simplified procedure will be followed. Local concerns which may arise as a result of inappropriate implementation of pollution prevention and control plan, the main aim of which is the reduction of adverse impacts to acceptable levels. These issues will be best addressed through open dialogue and a responsive approach, with acknowledgement of errors wherever appropriate, followed by rapid remedial action.

Any public complain and grievance with respect to generation of pollutants, inappropriate and inadequate pollution control measures, use of public resources such as water resource will be seriously dealt with. Once such notice and verbal/written



complain notice, it will be brought to Project EHS committee and based on the severity of the complaint, it will be dealt with appropriate resolution and action plan. All such complains/grievances will be recorded along with the close out reports.

**Table-3 Site selection criteria checklist for accommodation camp**

Name of Site with address  
Chainage  
Site In charge/Project Manager  
Community Liaison Officer (CLO)  
Environmental Manager (contractor)  
Date of inspection  
Photographs

S. No	POINTS	OBSERVATION	Remarks
1.	Is the land falls within 500 m of nearby inhabitations?If Yes, than: 1. Give reason for selection 2. The community consultation	Yes/No	
2	Is it nearby water courses, canals etc where there is a probability of these resources getting polluted due to Proposed development? If Yes, then : 1. Give reason for selection 2. Pollution Prevention and Control measures proposed	Yes/No	
3	Is there potable water available? If No, then: 1. Provide details of source of potable water supply proposed for accommodation camps	Yes/No	
4	Are the entry roads / walkways / passages to camp kept clear? If Not, then what provisions are made to address the requirement?	Yes/No	
5	Is it located within ROW or not? If outside ROW: is the land owner consulted and prior consent taken from him/her prior to establishment? Provide documentary proof, if any.	Yes/No	
6	Is the site subject to landslide or heavy erosion? If Yes, then: 1. Reason for selection of site 2. Safety and Mitigation measures proposed?	Yes/No	
7	Is there any critically polluted area or industry which may affect the health? If yes, then 1. Reason for selection of site 2. Safety and Mitigation measures proposed?		

8	Is there any Environmentally Sensitive area nearby Accommodation Camp? If Yes, then:		
	1. Type of Area (Wildlife/National Park/ any other ecologically sensitive area) 2. Approx. Distance from Site 3. Mitigative and preventive measures proposed 4. Any other information		
9	Decision with observation, if any:		
Inspected By		Signature	
Site In charge/Project Manager			
Community Liaison Officer (CLO)			
Environmental Manager(contractor)			

**Table-4 Checklist for routine weekly inspection of accommodation camp**

S.No	POINTS	OBSERVATION	MEASURES
	General		
1.	Are adequate no. of rooms provided?		
2.	Are labor camps located to avoid flooding and water logging?		
3.	Are the camps situated within a reasonable distance from worksite?		
4.	Transport from the living facilities to worksite is safe and free.		
5.	The living facilities are built with adequate materials, kept in good repair and kept clean and free from rubbish and other refuse.		
6.	Proper ventilation Provided?		
	Proper illumination provided?		
	The living rooms are kept cleaned at regular intervals?		
	Water		
7.	Is sufficient quantity of water being supplied for daily needs?		
8.	Is the water supplied for drinking meets the requirements of Drinking water standards.		
9.	All tanks used for storage of water are covered?		
10.	The water tanks are cleaned at regular intervals?		
	Washing & bathing facility		
11.	Is bathing & cloth washing facility Provided?		

12.	is there any water logging or stagnation of water near washing and bathing area.		
	Toilet Facilities		
13.	Is adequate numbers of toilets provided?		
14.	Is privacy maintained between two latrines?		
15.	Adequate quantity of water being supplied for toilet facilities?		
16.	Hand washing facility available outside toilets?		
17.	The toilets are regularly cleaned and maintained?		
	Waste Disposal		
18.	Adequate number of septic tanks provided to collect waste from toilets?		
19.	Soak pits provided at kitchen area?		
20.	Are the septic tanks & soak pits, Emptied on regular intervals?		
21.	are waste collection bins provided at site offices, canteen and labor colonies?		
22.	Are waste collection bins Emptied on regular intervals?		
23.	Are bins kept clean and maintained in good condition?		
	Cooking Area		
	Is cooking area provided and is separate from living room?		
24.	Is washing facility provided for cleaning of utensils?		
25.	Are cooking area kept clean and good hygiene is maintained?		
26.	Proper ventilation provided at cooking area?		
27.	Food waste and other waste properly collected and disposed off at regular intervals?		
28.	Hand washing facility provided outside cooking area?		
	Health, Medical & First Aid Facility		
29.	Is doctor visiting the site at regular intervals?		
30.	First Aid kit provided at site?		
31.	Adequate number of staff trained for first aider?		

32.	Is ambulance available at site?		
33.	Is guidance on alcohol, HIV-AIDS and other health risk related activities provided to workers?		
	Safety & Security		
34.	Is firefighting extinguishers provided at labor camp?		
35.	Is Emergency assembling points provided?		
36.	Is security guard provided at site?		
37.	Proper training provided to staff/worker to use fire extinguishers?		
	Any other Observation/Issue		

Date of Inspection:

Next Due Date:

Name & Signature

## ANNEXURE 2a

### BORROW AREA AND QUARRY MANAGEMENT PLAN

#### 1. BORROW AREAS MANAGEMENT

Borrow areas will be finalized as identified by Contractor and agreed by the project proponent in line with the requirements of the contract. In such cases arrangement for locating the source of supply of material for embankment and sub-grade as well as compliance to environment requirements in respect of excavation and borrow areas as stipulated from time to time by the Ministry of Environment and Forests, Government of India, and local bodies, as applicable shall be the sole responsibility of the Contractor.

The Contractor in addition to the established practices, rules and regulation will also consider following criteria before finalizing the locations.

- 1) The borrow area should not be located in agriculture field unless unavoidable i.e. barren land is not available to minimise the loss of productive & agricultural land and vegetation.
- 2) The borrow areas should not be located in forest area, notified environment protected zones like WLS, NP, settlements etc.
- 3) Sufficient quality of soil is available.
- 4) The Contractor will ensure the availability of suitable earth.
- 5) Borrow area near to any surface water body will be at least at a distance of 15 m from the toe of the bank or high flood level, whichever is maximum.

The Contractor shall obtain representative samples from each of the identified borrow areas and have these tested at the site laboratory following a testing programme as approved by the concerned Engineer. It shall be ensured that the fill material compacted to the required density

The Contractor shall submit the following information to the Engineer in-charge for approval at least 7 working days before commencement of compaction

- The values of maximum dry density and optimum moisture content obtained in accordance with IS: 2720 (Part 7) or (Part 8), as the case may be, appropriate for each of the fill materials he intends to use.
- A graph of density plotted against content from which, each of the values in (i) above of maximum dry density and optimum moisture content are determined.

After identification of borrow areas based on guidelines. Contractor will submit the details like location, geographical coordinates, photographs of the site of borrow area for approval of the "Engineer in-charge".

After receiving the approval Contractor will begin operations keeping in mind following;

- 1) Haulage of material to the areas of fill shall proceed only when sufficient spreading and compaction plants is operating at the place of deposition.
- 2) No excavated acceptable material other than surplus to requirements of the Contract shall be removed from the site. Contractor should be permitted to remove acceptable material from the site to suit his operational procedure, then he shall make good any consequent deficit of material arising there from.
- 3) Where the excavation reveals a combination of acceptable and un-acceptable materials, the Contractor shall, unless otherwise agreed by the Engineer in-charge, carryout the excavation in such a manner that the acceptable materials are excavated separately for use in the permanent works without contamination by the un-acceptable materials. The acceptable material shall be stockpiled separately.
- 4) The Contractor shall ensure that he does not adversely affect the stability of excavation or fills by the methods of stockpiling materials, use of plants or siting of temporary buildings or structures.

##### 1.1 Borrow Areas located in Agricultural Lands

- (i) The preservation of topsoil will be carried out in stockpile.
- (ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- (iii) Borrowing of earth will be carried out up to a depth of 1.5m from the existing ground level.
- (iv) Borrowing of earth will not be done continuously through out the stretch.
- (v) Ridges of not less than 8m widths will be left at intervals not exceeding 300m.
- (vi) Small drains will be cut through the ridges, if necessary, to facilitate drainage.
- (vii) The slope of the edges will be maintained not steeper than 1:4 (Vertical: Horizontal).

##### 1.2 Borrow Areas located on Elevated Lands

- (i) The preservation of topsoil will be carried out in stockpile

- (ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- (iii) At location where private owners desire their fields to be levelled, the borrowing shall be done to a depth of not more than 1.5m or up to the level of surrounding fields.

### **1.3 Borrow Areas near Riverside**

- (i) The preservation of topsoil will be carried out in stockpile
- (ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- (iii) Borrow area near to any surface water body will be at least at a distance of 15m from the toe of the bank or high flood level, whichever is maximum.

### **1.4 Borrow Areas near Settlements**

- (i) The preservation of topsoil will be carried out in stockpile
- (ii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- (iii) Borrow pit location will be located at least 0.8 km away from villages and settlements. If un-avoidable, the pit will not be dug for more than 30 cm depth and drains will be provided to facilitate drainage.
- (iv) Borrow pits located in such location will be re-developed immediately after borrowing is completed. If spoils are dumped, that will be covered with a layers of stockpiled topsoil in accordance with compliance requirements.

### **1.5 Borrow Pits along the alignment**

- (i) Borrow pits along the alignment shall be discouraged. If unavoidable the borrow should be minimum 10 m distance away from the alignment.
- (ii) The preservation of topsoil will be carried out in stockpile
- (iii) A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
- (iv) If permitted by the Engineer in-charge; these shall not be dug continuously.
- (v) Ridges of not less than 8m widths should be left at intervals not exceeding 300m.
- (vi) Small drains shall be cut through the ridges to facilitate drainage.
- (vii) The depth of the pits shall be so regulated that their bottom does not cut an imaginary line having a slope of 1 vertical to 4 horizontal projected from the edge of the final section of bank, the maximum depth of any case being limited to 1.5m.
- (viii) Also, no pit shall be dug within the offset width from the toe of the embankment required as per the consideration of stability with a minimum width of 10m.

### **1.6 Re-development of Borrow Areas**

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

Re-development plan will be prepared by the Contractor before the start of work inline with the owner's will and to the satisfaction of owner.

### **1.7 The Borrow Areas will be rehabilitated as follows;**

- Borrow pits will be backfilled with rejected construction wastes (unserviceable materials) compacted and will be given a turfing or vegetative cover on the surface. If this is not possible, then excavation slope should be smoothed and depression is filled in such a way that it looks more or less like the original ground surface.
- Borrow areas might be used for aquaculture in case landowner wants such development. In that case, such borrow area will be photographed after their post-use restoration and Environment Expert of Supervision Consultant will certify the post-use redevelopment.
- The Contractor will keep record of photographs of various stages i.e. before using materials form the location (pre-project), for the period borrowing activities (Construction Phase) and after rehabilitation (post development), to ascertain the pre and post borrowing status of the area. Contractor shall obtain approval prior closing the borrow area by Engineer in-charge.

## 2. LOCATING QUARRIES, REHABILITATING QUARRIES AND GUIDELINES FOR STONE CRUSHERS

### Locating Quarries

The Contractor will finalize the locations in consultation with Engineer in-charge. The Contractor shall establish a new quarry with the prior consent of the Engineer in-charge only in cases when

- i) Lead from existing quarries is uneconomical and
- ii) Alternative material sources are not available.

The Contractor shall prepare a redevelopment plan for the quarry site and get approved by the Engineer in-charge. For new quarry Environmental Clearance is required following with CTE and CTO & for stone crusher CTE and CTO is required. For existing quarry should have valid Environmental Clearance and consent.

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

### 2.1 Operation & redevelopment plan (if a new quarry is opened)

- Photograph of the quarry site prior to commencement
- The quarry boundaries as well as location of the material deposits, working equipment, stockpiling, access roads and final shape of the pit.
- Drainage and erosion control measures at site.
- Safety measures during quarry operation.
- Design for redevelopment of exhaust site.

**2.2.1 Option-A: Revegetating the quarry to merge with surrounding landscape:** This is done by conserving and reapplying the topsoil for the vegetative growth.

**2.2.2 Option-B: Developing exhausted quarries as water bodies:** The pit shall be reshaped and developed into pond, for harvesting rainwater. This option shall only be considered where the location of quarry is at the lowest point, i.e. surrounding areas/ natural drainage slopes towards it.

### 2.2.3 Construction stage:

Development of site:

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

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

### 2.2.4 Quarry operations including safety:

- i) Overburden shall be removed and disposed inline with Guidelines of Disposal Management.
- ii) During excavation, slopes shall be flatter than 20 degrees to prevent their sliding. In cases where quarry strata are good and where chances of sliding are less this restriction can be ignored.
- iii) In case of blasting, procedure and safety measures shall be taken as per applicable Explosive Rules.
- iv) The Contractor shall ensure that all workers related safety measures shall be done as per guidelines for workers and Safety.
- v) The contractor shall ensure maintenance of crushers regularly as per manufacture's recommendation.

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

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

### 2.2.5 Post construction stage:

The Contractor shall restore all haul roads constructed for transporting the material from the quarries to construction site to their original state.

The Engineer in-charge shall be entrusted the responsibility of reviewing the quarry site for the progress of implementation of Redevelopment plan. These shall include the following two cases;

- Redevelopment of quarries opened by the contractor for the project
- Redevelopment of existing quarries operated by other agencies

In the first case, the Contractor shall be responsible for the Redevelopment plan prior to completion after five years, during the defect liability period. The Engineer in-charge shall be responsible for reviewing this case of redevelopment prior to the issuing the defect liability certificate.

In the second case, the redevelopment of exhaust quarry shall be the responsibility of the agency providing the permit to ensure the implementation of Redevelopment Plan.

#### **2.2.6 Geological and Geomorphologic considerations:**

- i) No mining shall be allowed where the slope angles are more than 45 degree from horizontal and in case of mid slope mining, the foot wall should be of hard strata.
- ii) No mining lease shall be granted where the ore to overburden ratio is not economical i.e. 1:0.2 that is the waste generation should not be more than 20%
- iii) Proper appraisal of the deposit for its qualitative and quantitative assessment shall be made in the form of Geological and topographical plans.

#### **2.2.7 Technical consideration:**

- i) The area should not be highly jointed, fractured on consisting of weak planes.
- ii) Relation of slope angle to angle of repose should be within mining parameters where 6x6 m benches by keeping overall angle of repose as 45degree can be made.
- iii) No mining shall be allowed where subsidence of rocks is likely due to steep angle of slope.
- iv) No overhangs shall be allowed to be formed during the course of mining.
- v) The gradient of approach roads shall be gentle with hill-ward slope, side drains and parapet walls. Adequate number of waiting and crossing points shall be provided for safe plying of vehicles.
- vi) No blasting shall be resorted to without taking proper license under Explosive Act.

#### **2.2.8 General conditions:**

- i) Mining site shall only be handed over to the leaseholder, after it is duly demarcated by permanent boundary pillars and certified by concerned mining officer.
- ii) In addition to above the mining operation shall be subjected to provisions of various Acts and Rules in force.
- iii) Dumping of waste shall be done in earmarked places.

### **2.3 SOIL EROSION AND SEDIMENTATION CONTROL**

Prior to the start of the relevant construction, the Contractor shall submit to the Engineer in-charge for approval, his schedules for carrying out temporary and permanent erosion/sedimentation control works as are applicable for the items of clearing and grubbing, service roads and drainage excavation, embankment/sub-grade construction, bridges and other structures across water courses, pavement courses and shoulders. He shall also submit for approval his proposed method of erosion/sedimentation control on service road and borrow pits and his plan for disposal of waste materials. Work shall not be started until the erosion/sedimentation control schedules are prepared and the Engineer in-charge has approved methods of operations for the applicable construction.

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

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

Temporary erosion/sedimentation and pollution control measures will be used to control the phenomenon of erosion, sedimentation and pollution that may develop during normal construction practices, but may neither be foreseen during design stage for associated with permanent control features on the Project.

Where erosion or sedimentation is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion or sedimentation control features



can follow immediately thereafter if the project conditions permit; otherwise temporary erosion or sedimentation control measures may be required between successive construction stages. Under no conditions shall a large surface area of credible earth material be exposed at one time by clearing and grubbing or excavation without prior approval of the Engineer in-charge.

The Engineer in-charge may limit the area of excavation, borrow and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seedling and other such permanent erosion, sedimentation and pollution control measures, in accordance with the accepted schedule.

Temporary erosion is sometimes caused due to the Contractor's negligence, carelessness or failure to install permanent controls.

Sedimentation and pollution control measures then become necessary as a part of the work as scheduled or ordered by the Engineer-in-charge, and these shall be carried out at the Contractor's own expense.

Temporary erosion, sedimentation and pollution control work required, which is not attributed to the Contractor's negligence, carelessness or failure to install permanent controls, will be performed as ordered by the Engineer in-charge.

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

The temporary erosion, sedimentation and pollution control features installed by the Contractor shall be maintained by him till these are needed, unless otherwise agreed by the Engineer in-charge.

The main sources of erosion for the site will be splash and sheet erosion in rainfall events. To minimise the generation and discharge of sediment the following key principals will be applied:

- Employing sediment retention devices where practical;
- Rapidly stabilise exposed areas; and
- Minimise the areas of disturbance (both duration of works and physical area)
- By exposing only those areas that are required to be exposed for active demolition/earthworking at one time, the duration of exposure and risk of erosion/sediment discharge can also be minimised

The control methods used will ensure:

- Stabilisation and cover of exposed areas as soon as practically possible;
- Installation of perimeter controls to protect the environment from the demolition/earthworks. The work site shall include perimeter hoardings and temporary fencing to ensure separation of the work site from the public.

Capture and treatment of sediment laden water generated by the site works.

***ANNEXURE - 3 - BASELINE SOIL TEST  
REPORTS***

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225001 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at New Light Public School, Manipur from 20/11/2022.

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 20/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: New Light Public	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	7.01	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	388	USDA Method
3	Permeability	-	1.8×10 <sup>-3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	51	USDA Method
	Clay	%	34	
	Sand	%	15	
5	Sodium Absorption Ratio	-	0.71	USDA Method
6	Cation Exchange Capacity	Meq/100gm	16.6	IS 2720(P-24)
7	Porosity	%	33.3	USDA Method
8	Water Holding Capacity	%	43.1	USDA Method
9	Bulk Density	gm/cc	1.25	USDA Method
10	Chloride as Cl	mg/kg	581	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	1680	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	144.7	ELPL/III/SOP/44
13	Potassium as K	mg/kg	169.6	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	897	ELPL/III/SOP/43
15	Organic matter	%	1.63	IS 2720(P-22)
16	Available Nitrogen	mg/kg	35.7	ELPL/III/SOP/49
17	Phosphorous	mg/kg	22.4	ELPL/III/SOP/47

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
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CIN-U93000DL2014PTC267663

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225001 S  
Issue Date : 23/01/2023  
Your Reference : Email

Project – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

Sample Particulars: Soil sample was Collected at New light Public School, Manipur from 20/11/2022.

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 20/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2022
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: New light Public School	Sampling Method	: Grab Method

### Test Results

(Page 2 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL	USEPA 6010 C
20	Lead as Pb	mg/kg	14	USEPA 6010 C
21	Nickel as Ni	mg/kg	6.5	USEPA 6010 C
22	Zinc as Zn	mg/kg	11	USEPA 6010 C
23	Copper as Cu	mg/kg	14.5	USEPA 6010 C
24	Iron as Fe	mg/kg	11388	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
Checked By  
(VIKASH KUMAR)

  
Authorized Signatory  
(SNEH SMITA)



## TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225002 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Marjing Polo Farm Road 33KV, Manipur from 22/11/2022.

Type of sample	: Soil	Sample Registration Date	: 25/11/2022
Sampling Date	: 22/11/2022	Analysis Starting Date	: 25/11/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Marjing polo Farm road 33kv	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	5.41	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	237	USDA Method
3	Permeability	-	1.6×10 <sup>-3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	48	USDA Method
	Clay	%	35	
	Sand	%	17	
5	Sodium Absorption Ratio	-	0.76	USDA Method
6	Cation Exchange Capacity	Meq/100gm	10.35	IS 2720(P-24)
7	Porosity	%	42.9	USDA Method
8	Water Holding Capacity	%	41.9	USDA Method
9	Bulk Density	gm/cc	1.05	USDA Method
10	Chloride as Cl	mg/kg	486.5	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	921.6	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	120	ELPL/III/SOP/44
13	Potassium as K	mg/kg	140	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	607.4	ELPL/III/SOP/43
15	Organic matter	%	4.4	IS 2720(P-22)
16	Available Nitrogen	mg/kg	36.6	ELPL/III/SOP/49
17	Phosphorous	mg/kg	16.2	ELPL/III/SOP/47

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(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Lab Reference No. : 221225002 S  
Issue Date : 23/01/2023  
Your Reference : Email

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Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 22/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Marjing polo farm road 33kv	Sampling Method	: Grab Method

### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL-2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL-2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	13.8	USEPA 6010 C
21	Nickel as Ni	mg/kg	6.0	USEPA 6010 C
22	Zinc as Zn	mg/kg	9.5	USEPA 6010 C
23	Copper as Cu	mg/kg	14.3	USEPA 6010 C
24	Iron as Fe	mg/kg	10588	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
Checked By  
(VIKASH KUMAR)

  
Authorized Signatory  
(SNEH SMITA)



## TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225003 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Royal Academy Of Science, Manipur from 21/11/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 21/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Royal Academy Of Science	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	7.57	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	212	USDA Method
3	Permeability	-	1.4*10.3 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	52	USDA Method
	Clay	%	36	
	Sand	%	12	
5	Sodium Absorption Ratio	-	1.03	USDA Method
6	Cation Exchange Capacity	Meq/100gm	11.09	IS 2720(P-24)
7	Porosity	%	1.43	USDA Method
8	Water Holding Capacity	%	40.1	USDA Method
9	Bulk Density	gm/cc	1.43	USDA Method
10	Chloride as Cl	mg/kg	293	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	1705.4	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	173.2	ELPL/III/SOP/44
13	Potassium as K	mg/kg	197.9	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	264.5	ELPL/III/SOP/43
15	Organic matter	%	2.1	IS 2720(P-22)
16	Available Nitrogen	mg/kg	42.8	ELPL/III/SOP/49
17	Phosphorous	mg/kg	30.1	ELPL/III/SOP/47

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(VIKASH KUMAR)

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(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
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Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225003 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Royal Academy Of Science, Manipur from 21/11/2022.

Type of sample	: Soil	Sample Registration Date	: 25/12/222
Sampling Date	: 21/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Royal Academy Of Science	Sampling Method	: Grab Method

### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL-2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL-2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	10	USEPA 6010 C
21	Nickel as Ni	mg/kg	7	USEPA 6010 C
22	Zinc as Zn	mg/kg	19	USEPA 6010 C
23	Copper as Cu	mg/kg	10	USEPA 6010 C
24	Iron as Fe	mg/kg	5925	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
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(VIKASH KUMAR)

  
Authorized Signatory  
(SNEH SMITA)





## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225004 S  
Issue Date : 23/01/2023  
Your Reference : Email

Project -- Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Lairkyengbam Malcha Leikai (Salanthong) Manipur from 21/11/2022.


Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 21/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Lairkyengbam Malcha Leikai (Salanthong)	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	7.14	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	501	USDA Method
3	Permeability	-	1.6*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	50	USDA Method
	Clay	%	36	
	Sand	%	14	
5	Sodium Absorption Ratio	-	0.32	USDA Method
6	Cation Exchange Capacity	Meq/100gm	11.4	IS 2720(P-24)
7	Porosity	%	40	USDA Method
8	Water Holding Capacity	%	42.1	USDA Method
9	Bulk Density	gm/cc	1	USDA Method
10	Chloride as Cl	mg/kg	386.3	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	1252.5	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	53.7	ELPL/III/SOP/44
13	Potassium as K	mg/kg	147	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	570	ELPL/III/SOP/43
15	Organic matter	%	1.37	IS 2720(P-22)
16	Available Nitrogen	mg/kg	40.6	ELPL/III/SOP/49
17	Phosphorous	mg/kg	28.4	ELPL/III/SOP/47

  
Checked By  
(VIKASH KUMAR)

  
Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225004 S  
Issue Date : 23/01/2023  
Your Reference : Email

Project – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

Sample Particulars: Soil sample was Collected at Lairkyengbam Malcha Leikai (Salanthong), Manipur from 21/11/2022.

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 21/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Lairkyengbam Malcha Leikai (Salanthong)	Sampling Method	: Grab Method

### Test Results

(Page 2 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	12.3	USEPA 6010 C
21	Nickel as Ni	mg/kg	10	USEPA 6010 C
22	Zinc as Zn	mg/kg	16.5	USEPA 6010 C
23	Copper as Cu	mg/kg	11.5	USEPA 6010 C
24	Iron as Fe	mg/kg	8375	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
Checked By  
(VIKASH KUMAR)

  
Authorized Signatory  
(SNEH SMITA)





**ECOSTEPS LABORATORY PRIVATE LIMITED**  
 (Complete Test House For Testing of Environmental sample)  
 MoEF&CC Approved Laboratory  
 ISO 9001 : 2015 & ISO 45001 : 2018 Certified

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
 Lab Reference No. : 221225005 S  
 Issue Date : 23/01/2023  
 Your Reference : Email

Project -- Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

Sample Particulars: Soil sample was Collected at Near Ghanapriya Womens College, Manipur from 15/11/2022.

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 15/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Ghanapriya Womens College	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	8.55	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	240	USDA Method
3	Permeability	-	2.2*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	51	USDA Method
	Clay	%	37	
	Sand	%	12	
5	Sodium Absorption Ratio	-	0.29	USDA Method
6	Cation Exchange Capacity	Meq/100gm	25	IS 2720(P-24)
7	Porosity	%	31.2	USDA Method
8	Water Holding Capacity	%	40.4	USDA Method
9	Bulk Density	gm/cc	1.25	USDA Method
10	Chloride as Cl	mg/kg	282.6	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	4562.3	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	74.9	ELPL/III/SOP/44
13	Potassium as K	mg/kg	199.7	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	169.8	ELPL/III/SOP/43
15	Organic matter	%	3.43	IS 2720(P-22)
16	Available Nitrogen	mg/kg	48.2	ELPL/III/SOP/49
17	Phosphorous	mg/kg	38.7	ELPL/III/SOP/47

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
 (SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
 Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DJ2014PTC267663

## TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225005 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Ghanapriya Womens College, Manipur from 15/11/2022.

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 15/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Ghanapriya Womens College	Sampling Method	: Grab Method


### Test Results

(Page 2 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	10	USEPA 6010 C
21	Nickel as Ni	mg/kg	6	USEPA 6010 C
22	Zinc as Zn	mg/kg	25	USEPA 6010 C
23	Copper as Cu	mg/kg	8	USEPA 6010 C
24	Iron as Fe	mg/kg	4773.8	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
**Checked By**  
(VIKASH KUMAR)

  
**Authorized Signatory**  
(SNEHA SMITA)

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225011 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Chinganga Kha Canchipur Road, Manipur from 20/11/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 20/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Chinganga Kha Canchipur Road	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	8.43	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	225	USDA Method
3	Permeability	-	1*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	48	USDA Method
	Clay	%	42	
	Sand	%	10	
5	Sodium Absorption Ratio	-	0.17	USDA Method
6	Cation Exchange Capacity	Meq/100gm	22.5	IS 2720(P-24)
7	Porosity	%	25	USDA Method
8	Water Holding Capacity	%	42	USDA Method
9	Bulk Density	gm/cc	1.25	USDA Method
10	Chloride as Cl	mg/kg	390.5	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	3406.1	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	40	ELPL/III/SOP/44
13	Potassium as K	mg/kg	175	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	607.4	ELPL/III/SOP/43
15	Organic matter	%	2.72	IS 2720(P-22)
16	Available Nitrogen	mg/kg	30.6	ELPL/III/SOP/49
17	Phosphorous	mg/kg	32.2	ELPL/III/SOP/47

*V. Kumar*  
**Checked By**  
(VIKASH KUMAR)

*Sneha Smita*  
**Authorized Signatory**  
(SNEH SMITA)

## TEST REPORT

Issued to  
**M/s Rodic Consultants Private Limited**  
**In JV with M/s K & J Projects Private Limited**  
**Ward No. 11, Mamang Leikai Bishanpur Bazar,**  
**Ngaikhong Near Ngaikhong Parking,**  
**Bishanpur, Manipur**

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
**Lab Reference No.** : 221225011 S  
**Issue Date** : 23/01/2023  
**Your Reference** : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Chinganga Kha Canchipur Road, Manipur from 20/11/2022.

<b>Type of sample</b>	: Soil	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 20/11/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 1 Kg approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Chinganga Kha Canchipur Road	<b>Sampling Method</b>	: Grab Method


### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	11.7	USEPA 6010 C
21	Nickel as Ni	mg/kg	16	USEPA 6010 C
22	Zinc as Zn	mg/kg	38	USEPA 6010 C
23	Copper as Cu	mg/kg	11	USEPA 6010 C
24	Iron as Fe	mg/kg	8125	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
**Checked By**  
 (VIKASH KUMAR)

  
**Authorized Signatory**  
 (SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225012 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Ghari Makha Leikai Pukhari, Manipur from 24/11/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 24/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Ghari Makha Leikai Pukhari	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	7.51	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	402	USDA Method
3	Permeability	-	1.4*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	55	USDA Method
	Clay	%	36	
	Sand	%	9	
5	Sodium Absorption Ratio	-	0.48	USDA Method
6	Cation Exchange Capacity	Meq/100gm	20.8	IS 2720(P-24)
7	Porosity	%	31.6	USDA Method
8	Water Holding Capacity	%	43	USDA Method
9	Bulk Density	gm/cc	1.05	USDA Method
10	Chloride as Cl	mg/kg	584.8	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	2842.3	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	109.9	ELPL/III/SOP/44
13	Potassium as K	mg/kg	199.8	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	703.8	ELPL/III/SOP/43
15	Organic matter	%	5.06	IS 2720(P-22)
16	Available Nitrogen	mg/kg	55.8	ELPL/III/SOP/49
17	Phosphorous	mg/kg	46.1	ELPL/III/SOP/47

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
 Lab Reference No. : 221225012 S  
 Issue Date : 23/01/2023  
 Your Reference : Email

Project – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

Sample Particulars: Soil sample was Collected at Ghari Makha Leikai Pukhari, Manipur from 24/11/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 24/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Ghari Makha Leikai Pukhari	Sampling Method	: Grab Method

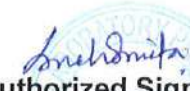
### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	13	USEPA 6010 C
21	Nickel as Ni	mg/kg	8	USEPA 6010 C
22	Zinc as Zn	mg/kg	18	USEPA 6010 C
23	Copper as Cu	mg/kg	13	USEPA 6010 C
24	Iron as Fe	mg/kg	7637.5	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
 Checked By  
 (VIKASH KUMAR)

  
 Authorized Signatory  
 (SNEH SMITA)



## TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225013 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Luwang Sangbam Haotabi, Manipur from 22/11/2022


Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 22/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Luwang Sangbam Haotabi	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	6.8	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	190	USDA Method
3	Permeability	-	2.1*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	50	USDA Method
	Clay	%	37	
	Sand	%	13	
5	Sodium Absorption Ratio	-	0.3	USDA Method
6	Cation Exchange Capacity	Meq/100gm	10.8	IS 2720(P-24)
7	Porosity	%	37.5	USDA Method
8	Water Holding Capacity	%	44	USDA Method
9	Bulk Density	gm/cc	1.25	USDA Method
10	Chloride as Cl	mg/kg	195.4	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	1562.5	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	50	ELPL/III/SOP/44
13	Potassium as K	mg/kg	40	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	340	ELPL/III/SOP/43
15	Organic matter	%	3.09	IS 2720(P-22)
16	Available Nitrogen	mg/kg	18.7	ELPL/III/SOP/49
17	Phosphorous	mg/kg	8.4	ELPL/III/SOP/47

  
**Checked By**  
(VIKASH KUMAR)

  
**Authorized Signatory**  
(SNEH SMITA)

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225013 S  
Issue Date : 23/01/2023  
Your Reference : Email

Project – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

Sample Particulars: Soil sample was Collected at Luwang Sangbam Haotabi, Manipur from 22/11/2022.

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 22/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Luwang Sangbam Haotabi	Sampling Method	: Grab Method

### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	12	USEPA 6010 C
21	Nickel as Ni	mg/kg	7.9	USEPA 6010 C
22	Zinc as Zn	mg/kg	15	USEPA 6010 C
23	Copper as Cu	mg/kg	8.5	USEPA 6010 C
24	Iron as Fe	mg/kg	8063	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225014 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** -- Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Malom To Hawairou Road, Manipur from 23/11/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 23/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Malom To Hawairou Road	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	7.26	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	185	USDA Method
3	Permeability	-	1.8*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	52	USDA Method
	Clay	%	38	
	Sand	%	12	
5	Sodium Absorption Ratio	-	0.27	USDA Method
6	Cation Exchange Capacity	Meq/100gm	16.1	IS 2720(P-24)
7	Porosity	%	40	USDA Method
8	Water Holding Capacity	%	42.1	USDA Method
9	Bulk Density	gm/cc	1.33	USDA Method
10	Chloride as Cl	mg/kg	292.3	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	2041.2	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	54.9	ELPL/III/SOP/44
13	Potassium as K	mg/kg	149.8	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	655.2	ELPL/III/SOP/43
15	Organic matter	%	0.31	IS 2720(P-22)
16	Available Nitrogen	mg/kg	41.2	ELPL/III/SOP/49
17	Phosphorous	mg/kg	15.9	ELPL/III/SOP/47

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
**In JV with M/s K & J Projects Private Limited**  
**Ward No. 11, Mamang Leikai Bishanpur Bazar,**  
**Ngaikhong Near Ngaikhong Parking,**  
**Bishanpur, Manipur**

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
**Lab Reference No.** : 221225014 S  
**Issue Date** : 23/01/2023  
**Your Reference** : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Malom To Hawairou Road, Manipur from 23/11/2022.

<b>Type of sample</b>	: Soil	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 23/11/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 1 Kg approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Malom To Hawairou Road	<b>Sampling Method</b>	: Grab Method

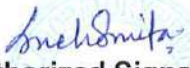
### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	11.8	USEPA 6010 C
21	Nickel as Ni	mg/kg	16	USEPA 6010 C
22	Zinc as Zn	mg/kg	16	USEPA 6010 C
23	Copper as Cu	mg/kg	10.8	USEPA 6010 C
24	Iron as Fe	mg/kg	6875	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
**Checked By**  
 (VIKASH KUMAR)

  
**Authorized Signatory**  
 (SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225015 S  
Issue Date : 23/01/2023  
Your Reference : Email

Project – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

Sample Particulars: Soil sample was Collected at NIIT Manipur from 02/12/2022

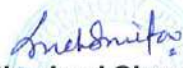
Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 02/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: NIIT	Sampling Method	: Grab Method

### Test Results

(Page1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	7.66	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	368	USDA Method
3	Permeability	-	1.6*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	50	USDA Method
	Clay	%	36	
	Sand	%	14	
5	Sodium Absorption Ratio	-	0.43	USDA Method
6	Cation Exchange Capacity	Meq/100gm	32.4	IS 2720(P-24)
7	Porosity	%	40.9	USDA Method
8	Water Holding Capacity	%	40.6	USDA Method
9	Bulk Density	gm/cc	0.91	USDA Method
10	Chloride as Cl	mg/kg	391	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	4286	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	125	ELPL/III/SOP/44
13	Potassium as K	mg/kg	199.9	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	1238.5	ELPL/III/SOP/43
15	Organic matter	%	0.25	IS 2720(P-22)
16	Available Nitrogen	mg/kg	50.6	ELPL/III/SOP/49
17	Phosphorous	mg/kg	36.2	ELPL/III/SOP/47

  
Checked By  
(VIKASH KUMAR)

  
Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
 Lab Reference No. : 221225015 S  
 Issue Date : 23/01/2023  
 Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at NIIT ,Manipur from 02/12/2022.

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 02/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: NIIT	Sampling Method	: Grab Method


### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	9	USEPA 6010 C
21	Nickel as Ni	mg/kg	5.5	USEPA 6010 C
22	Zinc as Zn	mg/kg	50	USEPA 6010 C
23	Copper as Cu	mg/kg	9.5	USEPA 6010 C
24	Iron as Fe	mg/kg	6213	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
 Checked By  
 (VIKASH KUMAR)

  
 Authorized Signatory  
 (SNEH SMITA)

## TEST REPORT

**Issued to**

**M/s Rodic Consultants Private Limited**  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225016 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Central Farm Lamphelpat Manipur from 02/12/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 02/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Central Farm Lamphelpat	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	7.01	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	262	USDA Method
3	Permeability	-	1.8*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	49	USDA Method
	Clay	%	39	
	Sand	%	12	
5	Sodium Absorption Ratio	-	0.6	USDA Method
6	Cation Exchange Capacity	Meq/100gm	17.2	IS 2720(P-24)
7	Porosity	%	38.1	USDA Method
8	Water Holding Capacity	%	41.3	USDA Method
9	Bulk Density	gm/cc	0.95	USDA Method
10	Chloride as Cl	mg/kg	489.1	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	2083.7	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	125	ELPL/III/SOP/44
13	Potassium as K	mg/kg	75	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	753.1	ELPL/III/SOP/43
15	Organic matter	%	1.73	IS 2720(P-22)
16	Available Nitrogen	mg/kg	16.4	ELPL/III/SOP/49
17	Phosphorous	mg/kg	11.4	ELPL/III/SOP/47

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)



**ECOSTEPS LABORATORY PRIVATE LIMITED**  
 (Complete Test House For Testing of Environmental sample)  
 MoEF&CC Approved Laboratory  
 ISO 9001 : 2015 & ISO 45001 : 2018 Certified

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
 Lab Reference No. : 221225016 S  
 Issue Date : 23/01/2023  
 Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Central Farm Lamphelpat ,Manipur from 02/12/2022.

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 02/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Central Farm Lamphelpat	Sampling Method	: Grab Method

### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	11	USEPA 6010 C
21	Nickel as Ni	mg/kg	9	USEPA 6010 C
22	Zinc as Zn	mg/kg	7	USEPA 6010 C
23	Copper as Cu	mg/kg	19.8	USEPA 6010 C
24	Iron as Fe	mg/kg	6185	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
 (SNEH SMITA)



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225017 S  
Issue Date : 23/01/2023  
Your Reference : Email

Project – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

Sample Particulars: Soil sample was Collected at Model Higher Secondary School, Manipur from 29/11/2022.

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 29/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Model Higher Secondary School	Sampling Method	: Grab Method

### Test Results

(Page1of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	6.88	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	201	USDA Method
3	Permeability	-	1.6*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	52	USDA Method
	Clay	%	39	
	Sand	%	9	
5	Sodium Absorption Ratio	-	1.18	USDA Method
6	Cation Exchange Capacity	Meq/100gm	11.8	IS 2720(P-24)
7	Porosity	%	29.4	USDA Method
8	Water Holding Capacity	%	42.2	USDA Method
9	Bulk Density	gm/cc	1.18	USDA Method
10	Chloride as Cl	mg/kg	293.4	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	1002	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	200	ELPL/III/SOP/44
13	Potassium as K	mg/kg	25	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	729	ELPL/III/SOP/43
15	Organic matter	%	1.94	IS 2720(P-22)
16	Available Nitrogen	mg/kg	32.2	ELPL/III/SOP/49
17	Phosphorous	mg/kg	60.4	ELPL/III/SOP/47

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225017 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Model Higher Secondary School, Manipur from 29/11/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 29/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Model Higher Secondary School	Sampling Method	: Grab Method


### Test Results

(Page 2 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	13	USEPA 6010 C
21	Nickel as Ni	mg/kg	7.5	USEPA 6010 C
22	Zinc as Zn	mg/kg	18	USEPA 6010 C
23	Copper as Cu	mg/kg	11	USEPA 6010 C
24	Iron as Fe	mg/kg	8888	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
Checked By  
(VIKASH KUMAR)

  
Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225018 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur


**Sample Particulars:** Soil sample was Collected at The United Progressive Development, Manipur from 29/11/2022

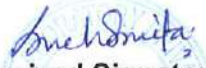
Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 29/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: The United Progressive Development	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	6.01	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	233	USDA Method
3	Permeability	-	2.4*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	50	USDA Method
	Clay	%	38	
	Sand	%	12	
5	Sodium Absorption Ratio	-	6.27	USDA Method
6	Cation Exchange Capacity	Meq/100gm	4.37	IS 2720(P-24)
7	Porosity	%	31.2	USDA Method
8	Water Holding Capacity	%	43.6	USDA Method
9	Bulk Density	gm/cc	1.25	USDA Method
10	Chloride as Cl	mg/kg	391	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	240	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	475	ELPL/III/SOP/44
13	Potassium as K	mg/kg	55	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	121.5	ELPL/III/SOP/43
15	Organic matter	%	2.52	IS 2720(P-22)
16	Available Nitrogen	mg/kg	55.1	ELPL/III/SOP/49
17	Phosphorous	mg/kg	6.9	ELPL/III/SOP/47

  
Checked By  
(VIKASH KUMAR)

  
Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
 Lab Reference No. : 221225018 S  
 Issue Date : 23/01/2023  
 Your Reference : Email

Project -- Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

Sample Particulars: Soil sample was Collected at The United Progressive Development, Manipur from 29/11/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 29/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: The United Progressive Development	Sampling Method	: Grab Method

### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	10.8	USEPA 6010 C
21	Nickel as Ni	mg/kg	BDL(DL -2.0)	USEPA 6010 C
22	Zinc as Zn	mg/kg	BDL(DL -2.0)	USEPA 6010 C
23	Copper as Cu	mg/kg	5	USEPA 6010 C
24	Iron as Fe	mg/kg	6188	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
 Checked By  
 (VIKASH KUMAR)

  
 Authorized Signatory  
 (SNEH SMITA)



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225019 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Near By Kongba Bazar Manipur from 27/11/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 27/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Near By Kongba Bazar	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	8.92	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	21	USDA Method
3	Permeability	-	1.5*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	51	USDA Method
	Clay	%	37	
	Sand	%	12	
5	Sodium Absorption Ratio	-	0.86	USDA Method
6	Cation Exchange Capacity	Meq/100gm	12.2	IS 2720(P-24)
7	Porosity	%	35.3	USDA Method
8	Water Holding Capacity	%	41.5	USDA Method
9	Bulk Density	gm/cc	1.17	USDA Method
10	Chloride as Cl	mg/kg	293.2	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	1362.6	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	150	ELPL/III/SOP/44
13	Potassium as K	mg/kg	20	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	583.1	ELPL/III/SOP/43
15	Organic matter	%	2.47	IS 2720(P-22)
16	Available Nitrogen	mg/kg	16.4	ELPL/III/SOP/49
17	Phosphorous	mg/kg	9.2	ELPL/III/SOP/47

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
 Lab Reference No. : 221225019 s  
 Issue Date : 23/01/2023  
 Your Reference : Email

Project – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

Sample Particulars: Soil sample was Collected at Near By Kongba Bazar, Manipur from 27/11/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 27/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Near By Kongba Bazar	Sampling Method	: Grab Method


### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	11	USEPA 6010 C
21	Nickel as Ni	mg/kg	7	USEPA 6010 C
22	Zinc as Zn	mg/kg	68	USEPA 6010 C
23	Copper as Cu	mg/kg	10	USEPA 6010 C
24	Iron as Fe	mg/kg	9375	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
 Checked By  
 (VIKASH KUMAR)

  
 Authorized Signatory  
 (SNEH SMITA)

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225020 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** -- Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Naoremthong Manipur from 27/11/2022

Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 27/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Naoremthong	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	6.27	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	22	USDA Method
3	Permeability	-	1.9*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	52	USDA Method
	Clay	%	37	
	Sand	%	11	
5	Sodium Absorption Ratio	-	0.72	USDA Method
6	Cation Exchange Capacity	Meq/100gm	17.4	IS 2720(P-24)
7	Porosity	%	22.2	USDA Method
8	Water Holding Capacity	%	40.4	USDA Method
9	Bulk Density	gm/cc	1.11	USDA Method
10	Chloride as Cl	mg/kg	293	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	1402.2	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	150	ELPL/III/SOP/44
13	Potassium as K	mg/kg	80	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	1190.2	ELPL/III/SOP/43
15	Organic matter	%	3.62	IS 2720(P-22)
16	Available Nitrogen	mg/kg	22.8	ELPL/III/SOP/49
17	Phosphorous	mg/kg	14.2	ELPL/III/SOP/47

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
 Lab Reference No. : 221225020 S  
 Issue Date : 23/01/2023  
 Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Naoremthong, Manipur from 27/11/2022


Type of sample	: Soil	Sample Registration Date	: 25/12/2022
Sampling Date	: 27/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Naoremthong	Sampling Method	: Grab Method


### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	9	USEPA 6010 C
21	Nickel as Ni	mg/kg	5.5	USEPA 6010 C
22	Zinc as Zn	mg/kg	15	USEPA 6010 C
23	Copper as Cu	mg/kg	9	USEPA 6010 C
24	Iron as Fe	mg/kg	4750	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
 Checked By  
 (VIKASH KUMAR)

  
 Authorized Signatory  
 (SNEH SMITA)



### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109033 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Kangla Near Remedy Hospital Manipur from 02/01/2023.

Type of sample	: Soil	Sample Registration Date	: 09/01/2023
Sampling Date	: 02/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Kangla Near Remedy Hospital	Sampling Method	: Grab Method

### Test Results

(Page 1 of 2)

S.No.	Test Parameters	Unit	Result	Test Method
1	pH (1:5)	-	7.37	IS 2720(P-26)
2	Conductivity (1:5)	µmhos/cm	157	USDA Method
3	Permeability	-	2.1*10 <sup>3</sup>	USDA Method
4.	Texture		Sandy Clay Loam	
	Silt	%	50	USDA Method
	Clay	%	37	
	Sand	%	13	
5	Sodium Absorption Ratio	-	0.24	USDA Method
6	Cation Exchange Capacity	Meq/100gm	16.5	IS 2720(P-24)
7	Porosity	%	37.5	USDA Method
8	Water Holding Capacity	%	42.2	USDA Method
9	Bulk Density	gm/cc	1.25	USDA Method
10	Chloride as Cl	mg/kg	195.6	ELPL/III/SOP/46
11	Calcium as Ca	mg/kg	3045.5	ELPL/III/SOP/42
12	Sodium as Na	mg/kg	50	ELPL/III/SOP/44
13	Potassium as K	mg/kg	45	ELPL/III/SOP/45
14	Magnesium as Mg	mg/kg	121.5	ELPL/III/SOP/43
15	Organic matter	%	4	IS 2720(P-22)
16	Available Nitrogen	mg/kg	14.3	ELPL/III/SOP/49
17	Phosphorous	mg/kg	8.2	ELPL/III/SOP/47

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

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In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109033 S  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur

**Sample Particulars:** Soil sample was Collected at Kangla Near By Remedy Hospital Manipur from 02/01/2023

Type of sample	: Soil	Sample Registration Date	: 09/01/2023
Sampling Date	: 02/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 16/01/2023
Quantity received	: 1 Kg approx.	Tests Required	: Mentioned below
Sample's Location	: Kangla Near By Remedy Hospital	Sampling Method	: Grab Method

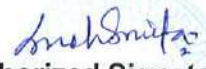
### Test Results

(Page2of 2)

S.No.	Test Parameters	Unit	Result	Test Method
18	Mercury as Hg	mg/kg	BDL(DL -2.0)	USEPA 6010 C
19	Cadmium as Cd	mg/kg	BDL(DL -2.0)	USEPA 6010 C
20	Lead as Pb	mg/kg	11	USEPA 6010 C
21	Nickel as Ni	mg/kg	6	USEPA 6010 C
22	Zinc as Zn	mg/kg	24.5	USEPA 6010 C
23	Copper as Cu	mg/kg	8.5	USEPA 6010 C
24	Iron as Fe	mg/kg	3737.5	USEPA 6010 C

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
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(VIKASH KUMAR)

  
Authorized Signatory  
(SNEH SMITA)

***ANNEXURE - 4 - BASELINE GROUND WATER  
TEST REPORTS***

### TEST REPORT

Issued to

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In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109017 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Mongsanggei awing leiki, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	7.87	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	446	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	24	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	63.6	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.31	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	36	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	310	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	120	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL 0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2014PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109017 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Mongsanggei awing leiki, Manipur on 03/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 03/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	0.35	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	14.6	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	0.1	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	0.05	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109017 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Mongsanggei awing leiki, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyriphos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630

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CIN-U93000DL2014PTC267663

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Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109017 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Mongsanggei awing leiki, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440
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### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
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CIN-U93000DL2014PTC267663

### TEST REPORT

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M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109018 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Nganapithong, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.30	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	690	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	36.1	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	118	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.23	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	48.2	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	630	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	210	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	0.15	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
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CIN-U93000DL2614PTC267663



### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109018 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Nganapithong, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	0.66	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	29.2	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	BDL(DL-0.05)	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	0.19	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL (DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
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CIN-U93000DL2614PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
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Date : 02 & 17.02.2018

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: 23/01/2023

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Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Nganapithong, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyrifos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

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### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	Trihalomethane					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
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### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.25	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	254	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	32.1	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	70.9	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.18	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	28.2	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	156	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	130	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL 0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
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### TEST REPORT

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### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	BDL(DL-0.05)	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	12.1	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	BDL(DL-0.05)	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	BDL(DL-0.05)	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
(VIKASH KUMAR)

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### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyriphos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

Checked By  
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S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

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Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from National Game Village Zone-1, Manipur on 03/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 03/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.34	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	218	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MEAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	28	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	56.2	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.16	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	21.7	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	150	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	115	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL 0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663



### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109020 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from National Game Village Zone-1, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	0.2	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	10.9	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	0.1	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	BDL(DL-0.05)	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL (DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
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CIN-U93000D14PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109020 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from National Game Village Zone-1, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyrifos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630

Checked By  
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### TEST REPORT

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Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109020 W

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Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from National Game Village Zone-1, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440
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### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit

DL: Detection Limit

Checked By  
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### TEST REPORT

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Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109021 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Langol zone -04, Manipur on 03/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 03/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.27	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	278	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	30.1	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	78.4	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.1	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	31.4	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	185	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	145	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL 0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109021 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Langol zone -04, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	0.16	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	15.8	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	0.16	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	0.14	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

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**TEST REPORT****Issued to**

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 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109021 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Langol zone -04, Manipur on 03/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 03/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

**Test Results**

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyrifos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
 (SNEH SMITA)

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 Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL29014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109021 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Langol zone -04, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit

DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2914PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Amend. No. & Amend.

Date : 02 & 17.02.2018

Lab Reference No.

: 230109022 W

Issue Date

: 23/01/2023

Your Reference

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Malom Tuliya, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.12	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	102	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	4.0	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	26.9	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.09	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	12.6	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	35	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	50	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	0.2	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
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CIN-U930002012014PTC267663



### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Lab Reference No.**

**Issue Date**

**Your Reference**

**Amend. No. & Amend.**

Date : 02 & 17.02.2018

: 230109022 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Malom Tuliayima, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	0.26	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	9.7	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	BDL(DL-0.05)	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	BDL(DL-0.05)	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BCL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109022 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Malom Tuliyaime, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyriphos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109022 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Malom Tuliyaime, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	Trihalomethane					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit

DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL29914PTC267663

### TEST REPORT

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In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109023 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Changangai maning Leikai, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	7.72	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	694	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	48.1	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	137	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.34	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	65.6	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	615	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	250	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	2.9	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	0.2	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 & 17.02.2018

**Lab Reference No.**

: 230109023 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

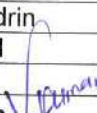
**Sample Particulars:** Ground water sample was collected from Changangai maning Leikai, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	11.48	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	31.6	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	0.12	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	0.7	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By:   
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109023 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Changangai maning Leikai, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyrifos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No. ELPL/IV/QF/20  
 Lab Reference No. : 230109023 W  
 Issue Date : 23/01/2023  
 Your Reference : Email

Amend. No. & Amend.  
 Date : 02 & 17.02.2018

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Changangai maning Leikai, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440
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### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	Trihalomethane					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
 DL: Detection Limit

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
 (SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
 Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2914PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109024 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Manipur College, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.18	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	778	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	58.1	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	193.2	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.41	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	BDL(DL5.0)	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	370	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	270	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL 0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
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CIN-U93000DL2920644PTC267663



### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109024 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Manipur College, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	BDL(DL-0.05)	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	30.4	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	0.08	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	BDL(DL0.05)	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Lab Reference No.**

**Issue Date**

**Your Reference**

**Amend. No. & Amend.**

Date : 02 & 17.02.2018

: 230109024 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Manipur College, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyrifos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000D12014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109024 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Manipur College, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
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Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
 DL: Detection Limit

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
 (SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
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CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Amend. No. & Amend.

Date : 02 & 17.02.2018

Lab Reference No.

: 230109025 W

Issue Date

: 23/01/2023

Your Reference

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Bamoncampu, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.31	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	273	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	28.1	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	66	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.19	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	34.5	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	205	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	125	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	0.15	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
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CIN-U93000D2004PTC267663

**TEST REPORT****Issued to**

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109025 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains,  
 Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Bamoncampu, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

**Test Results**

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	1.87	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	13.6	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	BDL (DL 0.05)	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	0.1	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	iS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
 (SNEH SMITA)

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CIN-U93000D12014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109025 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Bamoncampu, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyriphos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

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### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit

DL: Detection Limit

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CIN-U93000DL2904PTC267663

### TEST REPORT

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In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Keirao menjor inkhol, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
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<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.35	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	395	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	40.5	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	76.4	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.39	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	42.6	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	285	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	190	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL 0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2004PTC267663



**TEST REPORT**

Issued to

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 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Doc No.

ELPL/IV/QF/20

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Date : 02 &amp; 17.02.2018

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Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains,  
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Sample Particulars: Ground water sample was collected from Keirao menjor inkhol, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
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Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

**Test Results**

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	0.15	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	21.6	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	0.23	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	BDL(DL 0.05)	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
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**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Keirao menjor inkhol, Manipur on 04/01/2023.

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<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyriphos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

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: 230109026 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Keirao menjor inkhol, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	Trihalomethane					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

**TEST REPORT****Issued to**

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109027 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Thambalkhong, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

**Test Results**

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	7.92	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	812	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	54.1	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	161.4	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.46	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	49.1	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	660	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	280	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	0.16	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	0.3	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
 (SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
 Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109027 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Thambalkhong, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	17	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	34	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	0.17	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	3.67	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	0.03	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL (DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
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CIN-U93000DL2014PTC267663

### TEST REPORT

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M/s Rodic Consultants Private Limited  
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Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 & 17.02.2018

**Lab Reference No.**

: 230109027 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Thambalkhong, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyriphos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

Checked By  
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CIN-U93000B42014PTC267663

### TEST REPORT

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Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Date : 02 & 17.02.2018

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Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Thambalkhong, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit

DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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 Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Amend. No. &amp; Amend.

Date : 02 &amp; 17.02.2018

Lab Reference No.

: 230109028 W

Issue Date

: 23/01/2023

Your Reference

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains,  
 Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Kontha Ahallup, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

**Test Results**

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.24	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	697	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	42.1	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	154.1	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.27	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	49.2	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	650	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	265	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	0.13	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
 (SNEH SMITA)

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CIN-U93000DL2014PTC267663



### TEST REPORT

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Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Lab Reference No.

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Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109028 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Kontha Ahallup, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	2.48	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	38.9	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	BDL(DL0.05)	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	0.79	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL (DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109028 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Kontha Ahallup, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyriphos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109028 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Kontha Ahallup, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

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CIN-U93000DL2014PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109029 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars : Ground water sample was collected from Heingang, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	7.82	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	214	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	12	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	53.8	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.72	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	20.4	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	170	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	95	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
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CIN-U93000DL2014PTC267663

### TEST REPORT

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M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109029 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars : Ground water sample was collected from Heingang, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	2.1	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	15.6	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	BDL(DL0.05)	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	BDL(DL 0.05)	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109029 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars : Ground water sample was collected from Heingang, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyriphos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 & 17.02.2018

**Lab Reference No.**

: 230109029 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars** : Ground water sample was collected from Heingang, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109030 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

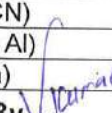
Sample Particulars: Ground water sample was collected from Potsangbam Khoiru, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.06	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	186	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	16	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	49.6	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.14	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	19.4	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	125	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	135	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By   
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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### TEST REPORT

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M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109030 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

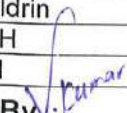
Sample Particulars: Ground water sample was collected from Potsangbam Khoiru, Manipur on 04/01/2023.

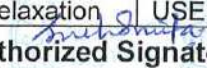
Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	4.1	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	11.6	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	0.12	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	0.06	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By:   
(VIKASH KUMAR)

  
Authorized Signatory  
(SNEHA SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. ELPL/IV/QF/20  
Lab Reference No. : 230109030 W  
Issue Date : 23/01/2023  
Your Reference : Email

Amend. No. & Amend.  
Date : 02 & 17.02.2018

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Potsangbam Khoiru, Manipur on 04/01/2023.

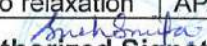
Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyrifos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	ng/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630

Checked By   
(VIKASH KUMAR)

  
Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

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In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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Doc No.

ELPL/IV/QF/20

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Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109030 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Potsangbam Khoiru, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440
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### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	Trihalomethane					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
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CIN-U93000DL2014PTC267663

### TEST REPORT

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M/s Rodic Consultants Private Limited  
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Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
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Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109031 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Luwang sangbamkameng , Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.04	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	282	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	36.1	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	88.1	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.2	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	29.1	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	160	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	165	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109031 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.


Sample Particulars: Ground water sample was collected from Luwang sangbamkameng , Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	BDL(DL 0.05)	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	18.2	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	0.25	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL 0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	0.53	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL 0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL 0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL (DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By:   
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
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Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109031 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Luwang sangbankameng , Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyriphos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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Ward No. 11, Mamang Leikai Bishanpur Bazar,  
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**Doc No.**

ELPL/IV/QF/20

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Date : 02 & 17.02.2018

**Lab Reference No.**

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**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Luwang sangbamkameng , Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440
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### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
<b>40</b>	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
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(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
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CIN-U93000DL2014PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Lab Reference No.**

**Issue Date**

**Your Reference**

**Amend. No. & Amend.**

Date : 02 & 17.02.2018

: 230109032 W

: 23/01/2023

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars P:** Ground water sample was collected from Kangla fort, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 4

S.No	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
1	Color	Hazen	BDL(DL5.0)	5	15	IS 3025 (Pt-04)
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-05)
3	pH	-	8.10	6.5-8.5	No relaxation	IS 3025 (Pt-11)
4	Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (Pt-08)
5	Turbidity	NTU	BDL(DL1.0)	1	5	IS 3025 (Pt-10)
6	Total Dissolved Solids	mg/l	235	500	2000	IS 3025 (Pt-16)
7	Ammonia (as total ammonia-N)	mg/l	BDL (DL0.5)	0.5	No relaxation	IS 3025 (Pt-34)
8	Anionic Detergents (as MBAS)	mg/l	BDL (DL0.1)	0.2	1.0	Annex K of IS 13428
9	Calcium as Ca	mg/l	30.8	75	200	IS 3025 (Pt-40)
10	Chloramines (as Cl <sub>2</sub> )	mg/l	BDL (DL0.1)	4.0	No relaxation	IS 3025 (Pt-26)
11	Chloride as Cl	mg/l	48.2	250	1000	IS 3025 (Pt-32)
12	Fluoride as F	mg/l	0.15	1.0	1.5	APHA 23 <sup>rd</sup> Ed 4500F
13	Free Residual Chlorine	mg/l	BDL (DL0.05)	0.2	1	IS 3025 (Pt-26)
14	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL1.0)	45	No relaxation	IS 3025 (Pt-34)
15	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	0.001	0.002	IS 3025 (Pt-43)
16	Sulphate as SO <sub>4</sub>	mg/l	18.2	200	400	IS 3025 (Pt-24)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-29)
18	Total Alkalinity as CaCO <sub>3</sub>	mg/l	150	200	600	IS 3025 (Pt-23)
19	Total Hardness as CaCO <sub>3</sub>	mg/l	145	200	600	IS 3025 (Pt-21)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	0.05	No relaxation	IS 3025 (Pt-27)
21	Aluminum (as Al)	mg/l	BDL(DL0.01)	0.03	0.2	APHA 23 <sup>rd</sup> Ed.3120B
22	Barium (as Ba)	mg/l	BDL(DL 0.1)	0.7	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B

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CIN-U93000DL2014PTC267663



### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109032 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars P:** Ground water sample was collected from Kangla fort, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 2 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
23	Boron (as B)	mg/l	BDL (DL 0.1)	0.5	1.0	APHA 23 <sup>rd</sup> Ed.3120B
24	Copper (as Cu)	mg/l	BDL(DL 0.02)	0.05	1.5	APHA 23 <sup>rd</sup> Ed.3120B
25	Iron as Fe	mg/l	0.2	1.0	No relaxation	IS 3025 (Pt-53)
26	Magnesium as Mg	mg/l	16.7	30	100	APHA 23 <sup>rd</sup> Ed.3500 B
27	Manganese as Mn	mg/l	0.35	0.1	0.3	APHA 23 <sup>rd</sup> Ed.3120B
28	Selenium (as Se)	mg/l	BDL (DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
29	Silver (as Ag)	mg/l	BDL(DL0.05)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
30	Zinc (as Zn)	mg/l	0.56	5	15	APHA 23 <sup>rd</sup> Ed.3120B
31	Cadmium (as Cd)	mg/l	BDL(DL0.001)	0.003	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
32	Lead (as Pb)	mg/l	BDL(DL 0.005)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
33	Mercury (as Hg)	mg/l	BDL(DL 0.001)	0.001	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
34	Molybdenum (as MO)	mg/l	BDL (DL 0.05)	0.07	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
35	Nickel (as Ni)	mg/l	BDL(DL0.01)	0.02	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
36	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	0.01	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
37	Total Chromium (as Cr)	mg/l	BDL( DL 0.03)	0.05	No relaxation	APHA 23 <sup>rd</sup> Ed.3120B
38	Mineral Oil	mg/l	BDL(DL-2.0)	0.5	No relaxation	IS 3025 (Part-39)
39	<b>Pesticides</b>					
i	Alachlor	ug/l	BDL(DL-7.0)	20	No relaxation	USEPA 507
ii	Atrazine	ug/l	BDL(DL-1.0)	2	No relaxation	USEPA 525.2
iii	Aldrin/Dieldrin	ug/l	BDL(DL-0.02)	0.03	No relaxation	USEPA 508
iv	Alpha HCH	ug/l	BDL(DL-0.01)	0.01	No relaxation	USEPA 508
v	Beta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508

Checked By  
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CIN-U93000DL2014PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109032 W  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars P:** Ground water sample was collected from Kangla fort, Manipur on 04/01/2023.

<b>Type of sample</b> : Ground Water	<b>Sample Registration Date</b> : 09/01/2023
<b>Sampling Date</b> : 04/01/2023	<b>Analysis Starting Date</b> : 09/01/2023
<b>Sampling Done by</b> : Lab representative	<b>Analysis Completion Date</b> : 20/01/2023
<b>Quantity received</b> : 2Ltr. approx.	<b>Tests Required</b> : Mentioned below
<b>Sample's Location</b> : Hand Pump	<b>Sampling Method</b> : ELPL/III/SOP/20

### Test Results

Page 3 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
vi	Butachlor	ug/l	BDL(DL-10.0)	125	No relaxation	USEPA 525.2
vii	Chloropyriphos	ug/l	BDL(DL-10.0)	30	No relaxation	USEPA 525.2
viii	Delta HCH	ug/l	BDL(DL-0.02)	0.04	No relaxation	USEPA 508
ix	2,4 Dichlorophenoxyacetic acid	ug/l	BDL(DL-5.0)	30	No relaxation	USEPA 515.1
x	OP isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xi	p,p isomers of DDT	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xii	DDE	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiii	DDD	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 508
xiv	Alpha Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xv	Beta Endosulfan	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvi	Endosulfan sulphate	ug/l	BDL(DL-0.2)	0.4	No relaxation	USEPA 508
xvii	Ethion	ug/l	BDL(DL-1.0)	03	No relaxation	USEPA 1657 A
xviii	Gamma HCH(Lindane)	ug/l	BDL(DL-1.0)	02	No relaxation	USEPA 508
xix	Isoproturon	ug/l	BDL(DL-3.0)	09	No relaxation	USEPA 532
xx	Malathion	ug/l	BDL(DL-10.0)	190	No relaxation	USEPA 8141 A
xxi	Methyl Parathion	ug/l	BDL(DL-0.2)	0.3	No relaxation	USEPA 8141 A
xxii	Monocrotophos	ug/l	BDL(DL-0.5)	01	No relaxation	USEPA 8141 A
xxiii	Phorate	ug/l	BDL(DL-0.6)	02	No relaxation	USEPA 8141 A
xxiv	PCB's	mg/l	BDL(DL-0.0005)	0.0005	No relaxation	APHA 23 <sup>rd</sup> Ed.6630
xxv	PAH	mg/l	BDL(DL-0.0001)	0.0001	No relaxation	APHA 23 <sup>rd</sup> Ed.6440

Checked By  
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CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109032 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars P:** Ground water sample was collected from Kangla fort, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 4 of 4

S.No.	Test Parameters	Units	Results	IS 10500 : 2012		Test Method
				Acceptable Limit, max.	Permissible Limit in the Absence of Alternate source, max.	
40	<b>Trihalomethane</b>					
i	Bromoform	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
ii	Dibromochloromethane	mg/l	BDL(DL-0.1)	0.1	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iii	Bromodichloromethane	mg/l	BDL(DL-0.06)	0.06	No relaxation	APHA 23 <sup>rd</sup> Ed.6232
iv	Chloroform	mg/l	BDL(DL-0.2)	0.2	No relaxation	APHA 23 <sup>rd</sup> Ed.6232

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2014PTC267663

***ANNEXURE - 5 - BASELINE SURFACE WATER  
TEST REPORTS***

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109001 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Surface water sample was collected from Ghanpriya Womens college, Manipur on 02/01/2023.

<b>Type of sample</b>	: Surface Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 02/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Ghanpriya Womens college	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.42	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	611	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	14	IS 3025 (Pt-17)
7	Temperature	°C	14°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	3.4	IS 3025 (Pt-34)
9	Total Kjeldhal Nitrogen	mg/l	7.6	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Grease	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	4.8	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.48	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	2.8	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	4	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	36	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL 0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

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CIN-U93000DL2614PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109001 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Surface water sample was collected from Ghanpriya Womens college, Manipur on 02/01/2023.

<b>Type of sample</b>	: Surface Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 02/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Ghanpriya Womens college	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.33	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.3	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	0.24	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL( DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit

DL: Detection Limit

*V. Kumar*  
Checked By  
(VIKASH KUMAR)

*Sneh Smita*  
Authorized Signatory  
(SNEH SMITA)

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### TEST REPORT

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Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109002 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Kangla, Manipur on 02/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 02/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Near Remedy Hospital	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	8.12	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	191	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	48	IS 3025 (Pt-17)
7	Temperature	°C	17°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	1.8	IS 3025 (Pt-34)
9	Total Kjeldhal Nitrogen	mg/l	2.2	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Grease	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	5.2	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	2.2	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	20	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	0.067	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109002 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Kangla, Manipur on 02/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 02/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Near Remedy Hospital	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.3	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.66	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	BDL( DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL( DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	0.13	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2014PTC267663



### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109003 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Surface water sample was collected from Luwang Sangbam, Manipur on 04/01/2023.

<b>Type of sample</b>	: Surface Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Pond	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	8.06	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	161	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	10	IS 3025 (Pt-17)
7	Temperature	°C	16°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	2.6	IS 3025 (Pt-34)
9	Total Kjehaldhal Nitrogen	mg/l	3.9	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Grease	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	5.9	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.16	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	3.0	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	32	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL 0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109003 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Luwang Sangbam, Manipur on 04/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	BDL(DL 0.01)	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.13	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	BDL( DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2014PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109004 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Surface water sample was collected from Royal Academy of Science, Manipur on 03/01/2023.

<b>Type of sample</b>	: Surface Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 03/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Pond	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.40	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	188	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	14	IS 3025 (Pt-17)
7	Temperature	°C	15°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	1.8	IS 3025 (Pt-34)
9	Total Kjehaldhal Nitrogen	mg/l	2.6	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Greace	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	7.4	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.25	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	2.0	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	36	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL 0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

**TEST REPORT****Issued to**

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109004 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Surface water sample was collected from Royal Academy of Science, Manipur on 03/01/2023.

<b>Type of sample</b>	: Surface Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 03/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Pond	<b>Sampling Method</b>	: ELPL/III/SOP/20

**Test Results**

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	BDL(DL 0.01)	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.60	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	0.053	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
 DL: Detection Limit

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
 (SNEH SMITA)

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CIN-U93000DL2014PTC267663

### TEST REPORT

**Issued to** M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.** ELPL/IV/QF/20  
**Lab Reference No.** : 230109005 W  
**Issue Date** : 23/01/2023  
**Your Reference** : Email

**Amend. No. & Amend. Date** : 02 & 17.02.2018

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Surface water sample was collected from Kongba Bazar, Manipur on 03/01/2023.

<b>Type of sample</b> : Surface Water	<b>Sample Registration Date</b> : 09/01/2023
<b>Sampling Date</b> : 03/01/2023	<b>Analysis Starting Date</b> : 09/01/2023
<b>Sampling Done by</b> : Lab representative	<b>Analysis Completion Date</b> : 20/01/2023
<b>Quantity received</b> : 2Ltr. approx.	<b>Tests Required</b> : Mentioned below
<b>Sample's Location</b> : Pond	<b>Sampling Method</b> : ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.94	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	285	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	18	IS 3025 (Pt-17)
7	Temperature	°C	15°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	3.6	IS 3025 (Pt-34)
9	Total Kjehaldhal Nitrogen	mg/l	5.2	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Greace	mg/l	BDL(DL-2.0)	IS 3025 (Pt-39)
12	Dissolve Oxygen as DO	mg/l	4.2	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.33	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	1.0	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	2.5	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	30	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL 0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL3014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109005 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Kongba Bazar, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.08	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.2	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	0.06	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2914PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109006 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from New Light Public School, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.48	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	265	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	11	IS 3025 (Pt-17)
7	Temperature	°C	16°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	4.2	IS 3025 (Pt-34)
9	Total Kjeldhal Nitrogen	mg/l	7.6	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Grease	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	3.6	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.31	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	2.27	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	5.2	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	44	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL 0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000D100014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109006 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from New Light Public School, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.75	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.16	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	0.15	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U930001202314PTC267663



### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109007 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from New Age Public School, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.55	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	102	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	06	IS 3025 (Pt-17)
7	Temperature	°C	15°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	1.1	IS 3025 (Pt-34)
9	Total Kjehaldhal Nitrogen	mg/l	1.7	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Greace	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	6.8	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.09	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	BDL(DL-2.0)	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	16	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL 0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109007 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from New Age Public School, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	BDL(DL-0.01)	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	BDL(DL-0.05)	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	BDL(DL-0.05)	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109008 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from The united Progressive development organization sagolband tera sayang, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.65	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	210	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	10	IS 3025 (Pt-17)
7	Temperature	°C	18°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	4.8	IS 3025 (Pt-34)
9	Total Kjealdhal Nitrogen	mg/l	6.6	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Greace	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	3.6	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.47	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	2.45	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	3.6	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	38	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL 0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109008 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from The united Progressive development organization sagolband tera sayang, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.15	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.23	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	0.066	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2914PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109009 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Model higher secondary School, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.54	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	131	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	12	IS 3025 (Pt-17)
7	Temperature	°C	16°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	1.6	IS 3025 (Pt-34)
9	Total Kjeldhal Nitrogen	mg/l	2.6	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Grease	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	5.9	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.35	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	2.8	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	32	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL 0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109009 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Model higher secondary School, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.63	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.58	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	0.09	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Amend. No. &amp; Amend.

Date : 02 &amp; 17.02.2018

Lab Reference No.

: 230109010 W

Issue Date

: 23/01/2023

Your Reference

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains,  
 Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Naremthong, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.85	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	182	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	14	IS 3025 (Pt-17)
7	Temperature	°C	12°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	6.2	IS 3025 (Pt-34)
9	Total Kjeldhal Nitrogen	mg/l	8.4	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Grease	mg/l	BDL(DL-2.0)	IS 3025 (Pt-39)
12	Dissolve Oxygen as DO	mg/l	2.9	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.15	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	5.15	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	4.4	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	48	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL 0.01)	IS 3025 (Pt-52)

Checked By  
 (VIKASH KUMAR)

Authorized Signatory  
 (SNEH SMITA)

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 Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2914PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109010 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Naremthong, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.93	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.35	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	0.08	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U930002014PTC267663



### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109011 W  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Surface water sample was collected from College of Food technology, Manipur on 03/01/2023.

<b>Type of sample</b>	: Surface Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 03/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Pond	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.80	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	236	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	26	IS 3025 (Pt-17)
7	Temperature	°C	20°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	1.4	IS 3025 (Pt-34)
9	Total Kjehaldhal Nitrogen	mg/l	2.1	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0:1)	IS 3025 (Pt-34)
11	Oil & Greace	mg/l	BDL(DL-2:0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	5.6	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.46	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	3.1	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	30	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	0.12	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
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Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to  
M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20  
Lab Reference No.  
Issue Date  
Your Reference

Amend. No. & Amend.  
Date : 02 & 17.02.2018  
: 230109011 W  
: 23/01/2023  
: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from College of Food technology, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.30	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	1.68	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	0.075	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	0.18	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U930002014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109012 W  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from NIIT, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.62	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	179	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	08	IS 3025 (Pt-17)
7	Temperature	°C	18°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	1.1	IS 3025 (Pt-34)
9	Total Kjeldhal Nitrogen	mg/l	2.0	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Grease	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	6.2	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.20	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	2.6	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	26	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL-0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Amend. No. & Amend.

Date : 02 & 17.02.2018

Lab Reference No.

: 230109012 W

Issue Date

: 23/01/2023

Your Reference

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from NIIT, Manipur on 03/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.05	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.058	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
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CIN-U93000B-2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109013 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Malom Bazar, Manipur on 04/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.46	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	102	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	16	IS 3025 (Pt-17)
7	Temperature	°C	18°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	1.7	IS 3025 (Pt-34)
9	Total Kjeldhal Nitrogen	mg/l	2.5	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Grease	mg/l	BDL(DL-2.0)	IS 3025 (Pt-39)
12	Dissolve Oxygen as DO	mg/l	6.7	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.24	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	BDL(DL-2.0)	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	18	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL-0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Amend. No. & Amend.

Date : 02 & 17.02.2018

Lab Reference No.

: 230109013 W

Issue Date

: 23/01/2023

Your Reference

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Surface water sample was collected from Malom Bazar, Manipur on 04/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.09	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	0.38	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2914PTC267663

### TEST REPORT

**Issued to** M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.** ELPL/IV/QF/20  
**Amend. No. & Amend. Date** : 02 & 17.02.2018  
**Lab Reference No.** : 230109014 W  
**Issue Date** : 23/01/2023  
**Your Reference** : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Surface water sample was collected from Ghasi, Manipur on 04/01/2023.

<b>Type of sample</b>	: Surface Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Pond	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.89	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	177	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	08	IS 3025 (Pt-17)
7	Temperature	°C	16°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	2.2	IS 3025 (Pt-34)
9	Total Kjeldhal Nitrogen	mg/l	2.9	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Greace	mg/l	BDL(DL-2.C)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	7.4	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	0.33	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	BDL(DL-2.0)	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	12	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	BDL(DL-0.01)	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000B72014PTC267663

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109014 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Ghasi, Manipur on 04/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.05	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	0.13	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U9300012020-14PTC267663



### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109015 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Salanthon, Manipur on 04/01/2023.

<b>Type of sample</b>	: Surface Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Pond	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.92	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	114	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	20	IS 3025 (Pt-17)
7	Temperature	°C	14 <sup>0</sup> c	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	1.6	IS 3025 (Pt-34)
9	Total Kjehaldhal Nitrogen	mg/l	3.2	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Greace	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	6.4	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	BDL(DL-0.01)	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	3.6	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	28	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	0.2	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109015 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Salanthonng, Manipur on 04/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.49	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	3.1	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	0.26	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

### TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date : 02 &amp; 17.02.2018

**Lab Reference No.**

: 230109016 W

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Surface water sample was collected from Marjing, Manipur on 04/01/2023.

<b>Type of sample</b>	: Surface Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 20/01/2023
<b>Quantity received</b>	: 2Ltr. approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Pond	<b>Sampling Method</b>	: ELPL/III/SOP/20

### Test Results

Page 1 of 2

S.No	Test Parameters	Units	Results	Test Method
1	Color	Hazen	BDL(DL5.0)	IS 3025 (Pt-04)
2	Odour	-	Unobjectionable	IS 3025 (Pt-05)
3	pH	-	7.70	IS 3025 (Pt-11)
4	Particle size Distribution	mg/l	Pass from 850 Micron Sieve	ELPL/III/SOP/57
5	Total Dissolved Solids	mg/l	119	IS 3025 (Pt-16)
6	Total suspended Solids	mg/l	34	IS 3025 (Pt-17)
7	Temperature	°C	20°C	By Thermometer
8	Ammonical Nitrogen (as NH <sub>4</sub> )	mg/l	0.9	IS 3025 (Pt-34)
9	Total Kjeldhal Nitrogen	mg/l	1.4	IS 3025 (Pt-34)
10	Free Ammonia	mg/l	BDL(DL-0.1)	IS 3025 (Pt-34)
11	Oil & Grease	mg/l	BDL(DL-2.0)	IS 3025 (Part-39)
12	Dissolve Oxygen as DO	mg/l	6.8	IS 3025 (Pt-38)
13	Fluoride as F	mg/l	BDL(DL-0.01)	APHA 23 <sup>rd</sup> Ed 4500F
14	Total Residual Chlorine	mg/l	BDL (DL0.05)	IS 3025 (Pt-26)
15	Nitrate as NO <sub>3</sub>	mg/l	BDL(DL-1.0)	IS 3025 (Pt-34)
16	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	BDL (DL0.001)	IS 3025 (Pt-43)
17	Sulphide (as H <sub>2</sub> S)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-29)
18	Biological Oxygen Demand as BOD	mg/l	BDL(DL-2.0)	IS 3025 (Pt-44)
19	Chemical Oxygen Demand as COD	mg/l	16	IS 3025 (Pt-58)
20	Cyanide (as CN)	mg/l	BDL(DL 0.02)	IS 3025 (Pt-27)
21	Hexavalent Chromium as Cr <sup>6</sup>	mg/l	0.18	IS 3025 (Pt-52)

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

### TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Lab Reference No.

Issue Date

Your Reference

Amend. No. & Amend.

Date : 02 & 17.02.2018

: 230109016 W

: 23/01/2023

: Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Surface water sample was collected from Marjing, Manipur on 04/01/2023.

Type of sample	: Surface Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 20/01/2023
Quantity received	: 2Ltr. approx.	Tests Required	: Mentioned below
Sample's Location	: Pond	Sampling Method	: ELPL/III/SOP/20

### Test Results

Page 2 of 2

S.No.	Test Parameters	Units	Results	Test Method
22	Dissolved Phosphate	mg/l	0.45	IS 3025 (Pt-31)
23	Copper (as Cu)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
24	Iron as Fe	mg/l	6.06	APHA 23 <sup>rd</sup> Ed.3120B
25	Manganese as Mn	mg/l	0.09	APHA 23 <sup>rd</sup> Ed.3120B
26	Selenium (as Se)	mg/l	BDL (DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
27	Vanadium	mg/l	BDL(DL0.01)	APHA 23 <sup>rd</sup> Ed.3120B
28	Zinc (as Zn)	mg/l	BDL(DL 0.05)	APHA 23 <sup>rd</sup> Ed.3120B
29	Cadmium (as Cd)	mg/l	BDL(DL0.003)	APHA 23 <sup>rd</sup> Ed.3120B
30	Lead (as Pb)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
31	Mercury (as Hg)	mg/l	BDL(DL 0.001)	APHA 23 <sup>rd</sup> Ed.3120B
32	Nickel (as Ni)	mg/l	BDL(DL0.02)	APHA 23 <sup>rd</sup> Ed.3120B
33	Total Arsenic (as As)	mg/l	BDL(DL 0.01)	APHA 23 <sup>rd</sup> Ed.3120B
34	Total Chromium (as Cr)	mg/l	0.22	APHA 23 <sup>rd</sup> Ed.3120B
35	Bio assay	-	90% survival of fish after 96 hr.in 100% sample	IS 6582 (Part-01)

\*\*\*\*\*END OF REPORT\*\*\*\*\*

BDL: Below Detection Limit  
DL: Detection Limit

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U930002014PTC267663

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109017 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Mongsanggei awing leikil, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
Analyzed By  
(RUPAL SHARMA)

  
Authorized Signatory  
(SNEHSMITA)



## TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
 Lab Reference No. : 230109018 M  
 Issue Date : 23/01/2023  
 Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Nganapithong, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 14/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

**Microbiological Parameter**

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Present	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Present	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
**Analyzed By**  
 (RUPAL SHARMA)

*Snehsmita*  
**Authorized Signatory**  
 (SNEHSMITA)



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109019 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Tharon Village, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
Analyzed By  
(RUPAL SHARMA)

*Snehsmita*  
Authorized Signatory  
(SNEHSMITA)



## TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109020 M  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from National Game Village Zone-1, Manipur on 03/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 03/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 11/01/2023
<b>Quantity received</b>	: 250 ml approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
**Analyzed By**  
(RUPAL SHARMA)

*Snehsmita*  
**Authorized Signatory**  
(SNEHSMITA)





## TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109021 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Langol Zone-04, Manipur on 03/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 03/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
**Analyzed By**  
(RUPAL SHARMA)

*Sneh Smिता*  
**Authorized Signatory**  
(SNEHSMITA)



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109022 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Malom tuliyaima ,Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

S.No.	Test Parameters	Units	Results	Microbiological Parameter	
				IS 10500 : 2012	Test Method
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
Analyzed By  
(RUPAL SHARMA)

*Snehsmita*  
Authorized Signatory  
(SNEHSMITA)



## TEST REPORT

### Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109023 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Changangai maning leikai ,Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
Analyzed By  
(RUPAL SHARMA)

*Snehsmita*  
Authorized Signatory  
(SNEHSMITA)



## TEST REPORT

### Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109024 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Manipur College, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

S.No.	Test Parameters	Units	Results	Microbiological Parameter		Test Method
				IS 10500 : 2012	Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml		IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml		IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
Analyzed By  
(RUPAL SHARMA)

*Snehsmita*  
Authorized Signatory  
(SNEHSMITA)



## TEST REPORT

### Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109025 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Bamoncampu, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
Analyzed By  
(RUPAL SHARMA)

*Snehsmita*  
Authorized Signatory  
(SNEHSMITA)



## TEST REPORT

Issued to : M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109026 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Keirao menjor inkhol, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 14/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Present	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Present	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
Analyzed By  
(RUPAL SHARMA)

*Snehsmita*  
Authorized Signatory  
(SNEHSMITA)



## TEST REPORT

### Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109027 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Thambalkhong, Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
Analyzed By  
(RUPAL SHARMA)

*Snehsmita*  
Authorized Signatory  
(SNEHSMITA)



## TEST REPORT

Issued to **M/s Rodic Consultants Private Limited**  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109028 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Kontha ahallup ,Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
Analyzed By  
(RUPAL SHARMA)

*Snehsmita*  
Authorized Signatory  
(SNEHSMITA)





## TEST REPORT

<b>Issued to</b>	<b>Doc No.</b>	: ELPL/IV/QF/20
<b>M/s Rodic Consultants Private Limited</b>	<b>Amend. No. &amp; Amend. Date</b>	: 02 & 17.02.2018
<b>In JV with M/s K &amp; J Projects Private Limited</b>	<b>Lab Reference No.</b>	: 230109029 M
<b>Ward No. 11, Mamang Leikai Bishanpur Bazar,</b>	<b>Issue Date</b>	: 23/01/2023
<b>Ngaikhong Near Ngaikhong Parking,</b>	<b>Your Reference</b>	: Email
<b>Bishanpur, Manipur</b>		

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Heingang , Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 11/01/2023
<b>Quantity received</b>	: 250 ml approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
**Analyzed By**  
 (RUPAL SHARMA)

  
**Authorized Signatory**  
 (SNEHSMITA)



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 230109030 M  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Potsangbam khoiru , Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
Analyzed By  
(RUPAL SHARMA)

*Snehsmita*  
Authorized Signatory  
(SNEHSMITA)



## TEST REPORT

**Issued to** : M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No. 11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking,  
Bishanpur, Manipur

**Doc No.** : ELPL/IV/QF/20  
**Amend. No. & Amend. Date** : 02 & 17.02.2018  
**Lab Reference No.** : 230109031 M  
**Issue Date** : 23/01/2023  
**Your Reference** : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ground water sample was collected from Luwang sangbamkameng, Manipur on 04/01/2023.

<b>Type of sample</b>	: Ground Water	<b>Sample Registration Date</b>	: 09/01/2023
<b>Sampling Date</b>	: 04/01/2023	<b>Analysis Starting Date</b>	: 09/01/2023
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 11/01/2023
<b>Quantity received</b>	: 250 ml approx.	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Hand Pump	<b>Sampling Method</b>	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
**Analyzed By**  
(RUPAL SHARMA)

  
**Authorized Signatory**  
(SNEHSMITA)



## TEST REPORT

Issued to **M/s Rodic Consultants Private Limited**  
 In JV with M/s K & J Projects Private Limited  
 Ward No. 11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking,  
 Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
 Amend. No. & Amend. Date : 02 & 17.02.2018  
 Lab Reference No. : 230109032 M  
 Issue Date : 23/01/2023  
 Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally aided projects(EAP) Public Works Department Government of Manipur.

Sample Particulars: Ground water sample was collected from Kangla fort , Manipur on 04/01/2023.

Type of sample	: Ground Water	Sample Registration Date	: 09/01/2023
Sampling Date	: 04/01/2023	Analysis Starting Date	: 09/01/2023
Sampling Done by	: Lab representative	Analysis Completion Date	: 11/01/2023
Quantity received	: 250 ml approx.	Tests Required	: Mentioned below
Sample's Location	: Hand Pump	Sampling Method	: ELPL/III/M/SOP/35

### Microbiological Parameter

Page 1 of 1

S.No.	Test Parameters	Units	Results	IS 10500 : 2012	Test Method
				Requirement	
1	Coliform	Per100ml	Absent	Absent / 100ml	IS:15185:2016
2	E.coli	Per100ml	Absent	Absent / 100ml	IS:15185:2016

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*Rupal*  
**Analyzed By**  
 (RUPAL SHARMA)

*Snehsmita*  
**Authorized Signatory**  
 (SNEHSMITA)



***ANNEXURE - 6 - BASELINE AMBIENT AIR  
TEST REPORTS***

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Advance Hospital, Manipur from 15/12/2022 to 20/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 15/12/2022 – 20/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Advance Hospital	Sampling Method	: ELPL/III/SOP/21

(Page 1 of 2)

### Location AAQ1

S.No	Test Parameters	Units	19-20/Dec 22 (Sampling date)	18-19/Dec22 (Sampling date)	16-17/Dec22 (sampling date)	15-16/Dec22 (sampling date)	NAAQS	Test Method
			221225092 A (Lab Code)	221225093 A (Lab Code)	221225094 A (Lab Code)	221225095 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	196	190	201	203	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	64.5	67.7	71	57.8	060 (24 Hourly)	ELPL/III/S OP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	22.8	23.7	28.4	24.3	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	9.6	8.8	10.1	9.2	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.40	0.39	0.36	0.44	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/S OP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

**Doc No.**

ELPL/IV/QF/20

**Amend. No. & Amend.**

Date :02 &amp; 17.02.2018

**Issue Date**

: 23/01/2023

**Your Reference**

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Advance Hospital, Manipur from 15/12/2022 to 20/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 15/12/2022 – 20/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Advance Hospital	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page2of 2)

**Location AAQ1**

S.No	Test Parameters	Units	19-20/Dec 22 (Sampling date)	18-19/Dec22 (Sampling date)	16-17/Dec22 (sampling date)	15-16/Dec22 (sampling date)	NAAQS	Test Method
			221225092 A (Lab Code)	221225093 A (Lab Code)	221225094 A (Lab Code)	221225095 A (Lab Code)		
7	Ozone as O3	µg/m <sup>3</sup>	BDL (DL-10)	12	14	10	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Amend. No. & Amend.

Date :02 & 17.02.2018

Issue Date

: 23/01/2023

Your Reference

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Malom Bazar, Manipur from 18/11/2022 to 05/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 18/11/2022 – 05/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Malom Bazar	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page1of 2)

### Location AAQ 8

S.No	Test Parameters	Units	04-05/Dec 22 (Sampling date)	29-30/Nov22 (Sampling date)	23-24/Nov22 (sampling date)	18-19/Nov22 (sampling date)	NAAQS	Test Method
			221225036 A (Lab Code)	221225044 A (Lab Code)	221225056 A (Lab Code)	221225071 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	175	191	126	151	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	75.1	79.6	64.5	69.2	060 (24 Hourly)	ELPL/III/S OP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	23.8	26.8	21.7	22.7	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	9.7	10.7	8.4	8.9	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.40	0.49	0.23	0.24	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/S OP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.

ELPL/IV/QF/20

Amend. No. & Amend.

Date : 02 & 17.02.2018

Issue Date

: 23/01/2023

Your Reference

: Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Malom Bazar, Manipur from 18/11/2022 to 05/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 18/11/2022 – 05/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Malom Bazar	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page 2 of 2)

### Location AAQ 8

S.No	Test Parameters	Units	04-05/Dec 22 (Sampling date)	29-30/Nov22 (Sampling date)	23-24/Nov22 (sampling date)	18-19/Nov22 (sampling date)	NAAQS	Test Method
			221225036 A (Lab Code)	221225044 A (Lab Code)	221225056 A (Lab Code)	221225071 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	12	14	10	12	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at St. Joseph School, Manipur from 18/11/2022 to 05/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 18/11/2022 – 05/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: St. Joseph School	Sampling Method	: ELPL/III/SOP/21

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### Location AAQ 15

S.No	Test Parameters	Units	04-05/Dec 22 (Sampling date)	29-30/Nov22 (Sampling date)	23-24/Nov22 (sampling date)	18-19/Nov22 (sampling date)	NAAQS	Test Method
			221225034 A (Lab Code)	221225046 A (Lab Code)	221225058 A (Lab Code)	221225075 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	188	196	192	171	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	58.2	92.5	102	84.3	060 (24 Hourly)	ELPL/III/S OP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	30.2	32.3	34.1	31.2	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	9.22	12.1	13.65	11.25	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.46	0.51	0.56	0.49	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/S OP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at St. Joseph School, Manipur from 18/11/2022 to 05/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 18/11/2022 – 05/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: St. Joseph School	Sampling Method	: ELPL/III/SOP/21

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### Location AAQ 15

S.No	Test Parameters	Units	04-05/Dec 22 (Sampling date)	29-30/Nov22 (Sampling date)	23-24/Nov22 (sampling date)	18-19/Nov22 (sampling date)	NAAQS	Test Method
			221225034 A (Lab Code)	221225046 A (Lab Code)	221225058 A (Lab Code)	221225075 A (Lab Code)		
7	Ozone as O3	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	12	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/ SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	RDL(DL- 0.01)	06 (Annual)	ELPL/III/ SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/ SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/ SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
Checked By  
(Vikash Kumar)

  
Authorized Signatory  
(Snehsmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
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Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Shishu Nistha Niketan, Manipur from 18/11/2022 to 05/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 18/11/2022 – 05/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Shishu Nistha Niketan	Sampling Method	: ELPL/III/SOP/21

(Page1of 2)

### Location AAQ 13

S.No	Test Parameters	Units	04-05/Dec 22 (Sampling date)	29-30/Nov22 (Sampling date)	23-24/Nov22 (sampling date)	18-19/Nov22 (sampling date)	NAAQS	Test Method
			221225035 A (Lab Code)	221225045 A (Lab Code)	221225057 A (Lab Code)	221225077 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	202	160	187	158	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	71.9	42.8	55.8	79.6	060 (24 Hourly)	ELPL/III/SOP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	23.5	23.1	24.3	25.4	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	7.96	7.65	8.15	9.75	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.34	0.16	0.24	0.36	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/SOP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Shishu Nistha Niketan, Manipur from 18/11/2022 to 05/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 18/11/2022 – 05/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Shishu Nistha Niketan	Sampling Method	: ELPL/III/SOP/21

(Page 2 of 2)

### Location AAQ 13

S.No	Test Parameters	Units	04-05/Dec 22 (Sampling date)	29-30/Nov22 (Sampling date)	23-24/Nov22 (sampling date)	18-19/Nov22 (sampling date)	NAAQS	Test Method
			221225035 A (Lab Code)	221225045 A (Lab Code)	221225057 A (Lab Code)	221225077 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	14.2	12.8	13.1	13.5	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
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Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at New Light Public School, Manipur from 19/11/2022 to 04/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 19/11/2022 – 04/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: New Light Public School	Sampling Method	: ELPL/III/SOP/21

(Page 1 of 2)

### Location AAQ 16

S.No	Test Parameters	Units	03-04/Dec 22 (Sampling date)	30-01/Dec22 (Sampling date)	24-25/Nov22 (sampling date)	19-20/Nov22 (sampling date)	NAAQS	Test Method
			221225032 A (Lab Code)	221225039 A (Lab Code)	221225059 A (Lab Code)	221225081 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	134	144	203	191	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	47.9	72.2	108.4	89.6	060 (24 Hourly)	ELPL/III/SOP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	26.2	27.6	29.9	28.8	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	8.42	9.14	10.35	9.96	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.31	0.35	0.43	0.41	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/SOP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
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Amend. No. & Amend.  
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Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at New Light Public School, Manipur from 19/11/2022 to 04/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 19/11/2022 – 04/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: New Light Public School	Sampling Method	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 16

S.No	Test Parameters	Units	03-04/Dec 22 (Sampling date)	30-01/Dec22 (Sampling date)	24-25/Nov22 (sampling date)	19-20/Nov22 (sampling date)	NAAQS	Test Method
			221225032 A (Lab Code)	221225039 A (Lab Code)	221225059 A (Lab Code)	221225081 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	14	12	10	11	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at St. Anthony High School, Manipur from 17/11/2022 to 04/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 17/11/2022 – 04/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: St. Anthony High School	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page1of 2)

### Location AAQ 14

S.No	Test Parameters	Units	03-04/Dec 22 (Sampling date)	27-28/Nov22 (Sampling date)	22-23/Nov22 (sampling date)	17-18/Nov22 (sampling date)	NAAQS	Test Method
			221225033 A (Lab Code)	221225054 A (Lab Code)	221225062 A (Lab Code)	221225069 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	180	192	145	169	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	51.8	59.4	42.5	48.6	060 (24 Hourly)	ELPL/III/S OP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	28.2	29.1	26.2	25.6	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	8.95	9.22	8.12	8.85	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.39	0.40	0.36	0.38	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/S OP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at St. Anthony High School, Manipur from 17/11/2022 to 04/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 17/11/2022 – 04/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: St. Anthony High School	Sampling Method	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 14

S.No	Test Parameters	Units	03-04/Dec 22 (Sampling date)	27-28/Nov22 (Sampling date)	22-23/Nov22 (sampling date)	17-18/Nov22 (sampling date)	NAAQS	Test Method
			221225033 A (Lab Code)	221225054 A (Lab Code)	221225062 A (Lab Code)	221225069 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	16.4	14.6	13.2	12.5	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Ahallup, Manipur from 07/12/2022 to 12/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 07/12/2022 – 12/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Ahallup	<b>Sampling Method</b>	: ELPL/III/SOP/21

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### Location AAQ 2

S.No	Test Parameters	Units	07-08/Dec 22 (Sampling date)	08-09/Dec22 (Sampling date)	11-12/Dec22 (sampling date)	10-11/Dec22 (sampling date)	NAAQS	Test Method
			221225027 A (Lab Code)	221225028 A (Lab Code)	221225089 A (Lab Code)	221225090 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	156	103	136	124	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	48.6	41.2	44.9	43.7	060 (24 Hourly)	ELPL/III/S OP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	31.2	22.8	26.3	27.1	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	12.3	8.1	9.5	10.8	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.70	0.21	0.30	0.33	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/S OP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023

Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Ahallup, Manipur from 07/12/2022 to 12/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 07/12/2022 – 12/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Ahallup	Sampling Method	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 2

S.No	Test Parameters	Units	07-08/Dec 22 (Sampling date)	08-09/Dec22 (Sampling date)	11-12/Dec22 (sampling date)	10-11/Dec22 (sampling date)	NAAQS	Test Method
			221225027 A (Lab Code)	221225028 A (Lab Code)	221225089 A (Lab Code)	221225090 A (Lab Code)		
7	Ozone as O3	µg/m <sup>3</sup>	14	12	BDL (DL-10)	BDL (DL-10)	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at RIMS Hospital, Manipur from 17/11/2022 to 03/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 17/11/2022 – 03/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: RIMS Hospital	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page1of 2)

### Location AAQ 11

S.No	Test Parameters	Units	02-03/Dec 22 (Sampling date)	27-28/Nov22 (Sampling date)	22-23/Nov22 (sampling date)	17-18/Nov22 (sampling date)	NAAQS	Test Method
			221225029 A (Lab Code)	221225055 A (Lab Code)	221225055 A (Lab Code)	221225067 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	199	168	167	174	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	108	66.1	47.3	96.4	060 (24 Hourly)	ELPL/III/S OP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	33.8	29.5	26.8	31.1	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	12.4	9.8	9.2	10.7	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.60	0.51	0.45	0.49	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/S OP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at RIMS Hospital, Manipur from 17/11/2022 to 03/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 17/11/2022 – 03/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: RIMS Hospital	Sampling Method	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 11

S.No	Test Parameters	Units	02-03/Dec 22 (Sampling date)	27-28/Nov22 (Sampling date)	22-23/Nov22 (sampling date)	17-18/Nov22 (sampling date)	NAAQS	Test Method
			221225029 A (Lab Code)	221225055 A (Lab Code)	221225055 A (Lab Code)	221225067 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	12.8	11.6	13.3	14.5	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	RDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at New Age Public School, Manipur from 19/11/2022 to 04/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 19/11/2022 – 04/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: New Age Public School	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page1 of 2)

### Location AAQ 9

S.No	Test Parameters	Units	03-04/Dec 22 (Sampling date)	30-01/Dec22 (Sampling date)	24-25/Nov22 (sampling date)	19-20/Nov22 (sampling date)	NAAQS	Test Method
			221225031 A (Lab Code)	221225037 A (Lab Code)	221225060 A (Lab Code)	221225079 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	186	156	178	208	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	72.8	41.6	58.1	80.4	060 (24 Hourly)	ELPL/III/S OP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	32.2	27.2	28.6	34.3	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	13.1	10.3	11.2	13.6	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.70	0.49	0.51	0.71	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/S OP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
**In JV with M/s K & J Projects Private Limited**  
**Ward No-11, Mamang Leikai Bishanpur Bazar,**  
**Ngaikhong Near Ngaikhong Parking**  
**Bishanpur, Manipur**

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at New Age Public School, Manipur from 19/11/2022 to 04/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 19/11/2022 – 04/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: New Age Public School	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 9

S.No	Test Parameters	Units	03-04/Dec 22 (Sampling date)	30-01/Dec22 (Sampling date)	24-25/Nov22 (sampling date)	19-20/Nov22 (sampling date)	NAAQS	Test Method
			221225031 A (Lab Code)	221225037 A (Lab Code)	221225060 A (Lab Code)	221225079 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Herbert School, Manipur from 18/11/2022 to 07/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 18/11/2022 – 07/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Herbert School	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page 1 of 2)

### Location AAQ 4

S.No	Test Parameters	Units	06-07/Dec 22 (Sampling date)	01-02/Dec22 (Sampling date)	24-25/Nov22 (sampling date)	18-19/Nov22 (sampling date)	NAAQS	Test Method
			221225026 A (Lab Code)	221225043 A (Lab Code)	221225047 A (Lab Code)	221225073 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	188	170	156	126	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	39.9	34.2	30.2	24.6	060 (24 Hourly)	ELPL/III/SOP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	29.7	27.5	25.1	23.2	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	12.2	11.3	10.3	8.5	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.33	0.30	0.26	0.24	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/SOP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Herbert School, Manipur from 20/11/2022 to 07/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 20/11/2022 – 07/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Herbert School	Sampling Method	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 4

S.No	Test Parameters	Units	06-07/Dec 22 (Sampling date)	01-02/Dec22 (Sampling date)	24-25/Nov22 (sampling date)	18-19/Nov22 (sampling date)	NAAQS	Test Method
			221225026 A (Lab Code)	221225043 A (Lab Code)	221225047 A (Lab Code)	221225073 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	12	14	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Royal Academy of Science, Manipur from 21/11/2022 to 06/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 21/11/2022 – 06/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Royal Academy of Science	Sampling Method	: ELPL/III/SOP/21

(Page1of 2)

### Location AAQ 12

S.No	Test Parameters	Units	05-06/Dec 22 (Sampling date)	30-01/Dec22 (Sampling date)	25-26/Nov22 (sampling date)	21-22/Nov22 (sampling date)	NAAQS	Test Method
			221225023 A (Lab Code)	221225038 A (Lab Code)	221225048 A (Lab Code)	221225065 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	183	161	207	187	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	72.6	53.1	94.2	111	060 (24 Hourly)	ELPL/III/SOP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	28.4	26.1	27.8	34.1	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	9.56	8.58	9.65	13.1	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.35	0.30	0.39	0.49	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/SOP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023

Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Royal Academy of Science, Manipur from 21/11/2022 to 06/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 21/11/2022 – 06/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Royal Academy of Science	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 12

S.No	Test Parameters	Units	05-06/Dec 22 (Sampling date)	30-01/Dec22 (Sampling date)	25-26/Nov22 (sampling date)	21-22/Nov22 (sampling date)	NAAQS	Test Method
			221225023 A (Lab Code)	221225038 A (Lab Code)	221225048 A (Lab Code)	221225065 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	10.2	11.3	12.6	10.5	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Kongba Bazar, Manipur from 21/11/2022 to 06/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 21/11/2022 – 06/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Kongba Bazar	Sampling Method	: ELPL/III/SOP/21

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### Location AAQ 5

S.No	Test Parameters	Units	05-06/Dec 22 (Sampling date)	01-02/Dec22 (Sampling date)	26-27/Nov22 (sampling date)	21-22/Nov22 (sampling date)	NAAQS	Test Method
			221225022 A (Lab Code)	221225041 A (Lab Code)	221225050 A (Lab Code)	221225087 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	182	129	204	197	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	96.8	82.4	109.2	105.5	060 (24 Hourly)	ELPL/III/S OP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	26.4	24.9	30.2	28.1	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	12.9	10.6	12.7	11.9	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.36	0.34	0.45	0.41	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/S OP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Kongba Bazar, Manipur from 21/11/2022 to 06/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 21/11/2022 – 06/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Kongba Bazar	Sampling Method	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 5

S.No	Test Parameters	Units	05-06/Dec 22 (Sampling date)	01-02/Dec22 (Sampling date)	26-27/Nov22 (sampling date)	21-22/Nov22 (sampling date)	NAAQS	Test Method
			221225022 A (Lab Code)	221225041 A (Lab Code)	221225050 A (Lab Code)	221225087 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	16	14	18	12	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Lawang Sangbam Haotabi, Manipur from 17/11/2022 to 03/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 17/11/2022 – 03/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Lawang Sangbam Haotabi	<b>Sampling Method</b>	: ELPL/III/SOP/21

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### Location AAQ 7

S.No	Test Parameters	Units	17-18/Nov 22 (Sampling date)	02-03/Dec22 (Sampling date)	27-28/Nov22 (sampling date)	22-23/Nov22 (sampling date)	NAAQS	Test Method
			221225009 A (Lab Code)	221225030 A (Lab Code)	221225053 A (Lab Code)	221225063 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	191	179	187	204	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	98.2	88.7	75.1	66.1	060 (24 Hourly)	ELPL/III/S OP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	31.2	29.6	26.8	24.5	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	12.4	10.5	11.9	8.5	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.46	0.43	0.35	0.28	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/S OP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Lawang Sangbam Haotabi, Manipur from 17/11/2022 to 03/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 17/11/2022 – 03/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Lawang Sangbam Haotabi	Sampling Method	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 7

S.No	Test Parameters	Units	21-22/Nov 22 (Sampling date)	05-06/Dec22 (Sampling date)	26-27/Nov22 (sampling date)	15-16/Dec22 (sampling date)	NAAQS	Test Method
			221225007 A (Lab Code)	221225021 A (Lab Code)	221225052 A (Lab Code)	221225088 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	10	12	16	10	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bisharapur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Lamlong Higher Secondary School, Manipur from 21/11/2022 to 16/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 21/11/2022 – 16/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Lamlong Higher Secondary School	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page1of 2)

### Location AAQ 6

S.No	Test Parameters	Units	21-22/Nov 22 (Sampling date)	05-06/Dec22 (Sampling date)	26-27/Nov22 (sampling date)	15-16/Dec22 (sampling date)	NAAQS	Test Method
			221225007 A (Lab Code)	221225021 A (Lab Code)	221225052 A (Lab Code)	221225088 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	195	198	157	189	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	98.7	96.4	82.6	88.6	060 (24 Hourly)	ELPL/III/SOP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	26.1	23.3	21.7	22.8	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	11.6	10.8	8.9	9.7	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.33	0.24	0.14	0.23	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/SOP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
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Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Lamlong Higher Secondary School, Manipur from 21/11/2022 to 16/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 21/11/2022 – 16/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Lamlong Higher Secondary School	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 6

S.No	Test Parameters	Units	21-22/Nov 22 (Sampling date)	05-06/Dec22 (Sampling date)	26-27/Nov22 (sampling date)	15-16/Dec22 (sampling date)	NAAQS	Test Method
			221225007 A (Lab Code)	221225021 A (Lab Code)	221225052 A (Lab Code)	221225088 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	14	BDL (DL-10)	12	BDL (DL-10)	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Prism Academy, Manipur from 20/11/2022 to 07/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 20/11/2022 – 07/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Prism Academy	Sampling Method	: ELPL/III/SOP/21

(Page1of 2)

### Location AAQ 10

S.No	Test Parameters	Units	06-07/Dec 22 (Sampling date)	01-02/Dec22 (Sampling date)	26-27/Nov22 (sampling date)	20-21/Nov22 (sampling date)	NAAQS	Test Method
			221225025 A (Lab Code)	221225042 A (Lab Code)	221225051 A (Lab Code)	221225083 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	141	122	168	188	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	58.7	46.8	67.6	87.2	060 (24 Hourly)	ELPL/III/SOP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	30.5	28.9	34.1	38.2	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	11.1	10.5	13.2	15.1	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.61	0.53	0.78	1.01	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/SOP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
 In JV with M/s K & J Projects Private Limited  
 Ward No-11, Mamang Leikai Bishanpur Bazar,  
 Ngaikhong Near Ngaikhong Parking  
 Bishanpur, Manipur

 Doc No.  
 ELPL/IV/QF/20

 Amend. No. & Amend.  
 Date :02 & 17.02.2018

Issue Date : 23/01/2023

Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains,  
 Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Prism Academy, Manipur from  
 20/11/2022 to 07/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 20/11/2022 – 07/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Prism Academy	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 10

S.No	Test Parameters	Units	06-07/Dec 22 (Sampling date)	01-02/Dec22 (Sampling date)	26-27/Nov22 (sampling date)	20-21/Nov22 (sampling date)	NAAQS	Test Method
			221225025 A (Lab Code)	221225042 A (Lab Code)	221225051 A (Lab Code)	221225083 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	12.6	12.8	10.9	13.3	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/ SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/ SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/ SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/ SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
 (Vikash Kumar)

Authorized Signatory  
 (SnehSmita)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Central Agriculture University, Manipur from 20/11/2022 to 07/12/2022.

Type of sample	: Ambient Air	Sample Registration Date	: 25/12/2022
Sampling Date	: 20/11/2022 – 07/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 10/01/2023
Quantity received	: 24 Hourly Sample	Tests Required	: Mentioned below
Sample's Location	: Central Agriculture University	Sampling Method	: ELPL/III/SOP/21

(Page1of 2)

### Location AAQ 3

S.No	Test Parameters	Units	06-07/Dec 22 (Sampling date)	01-02/Dec22 (Sampling date)	25-26/Nov22 (sampling date)	20-21/Nov22 (sampling date)	NAAQS	Test Method
			221225024 A (Lab Code)	221225040 A (Lab Code)	221225049 A (Lab Code)	221225085 A (Lab Code)		
1	Particulate Matter as PM <sub>10</sub>	µg/m <sup>3</sup>	104	85	137	128	100 (24 Hourly)	IS 5182 (Pt-23)
2	Particulate Matter as PM <sub>2.5</sub>	µg/m <sup>3</sup>	38.4	34.2	54.5	47.2	060 (24 Hourly)	ELPL/III/S OP/23
3	Sulphur Dioxide as SO <sub>2</sub>	µg/m <sup>3</sup>	21.9	19.6	21.1	18.6	080 (24 Hourly)	IS 5182 (Pt-02)
4	Oxides of Nitrogen as NO <sub>x</sub>	µg/m <sup>3</sup>	7.6	6.9	8.6	7.5	080 (24 Hourly)	IS 5182 (Pt-06)
5	Carbon Monoxide as CO	mg/m <sup>3</sup>	0.23	0.16	0.29	0.25	002 (08 Hourly)	IS 5182 (Pt-10)
6	Ammonia as NH <sub>3</sub>	µg/m <sup>3</sup>	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	BDL (DI-10)	400 (24 Hourly)	ELPL/III/S OP/27

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

## TEST REPORT

**Issued to**

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No.  
ELPL/IV/QF/20

Amend. No. & Amend.  
Date :02 & 17.02.2018

Issue Date : 23/01/2023

Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Air Monitoring was monitored at Central Agriculture University, Manipur from 20/11/2022 to 07/12/2022.

<b>Type of sample</b>	: Ambient Air	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 20/11/2022 – 07/12/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 10/01/2023
<b>Quantity received</b>	: 24 Hourly Sample	<b>Tests Required</b>	: Mentioned below
<b>Sample's Location</b>	: Central Agriculture University	<b>Sampling Method</b>	: ELPL/III/SOP/21

(Page2of 2)

### Location AAQ 3

S.No	Test Parameters	Units	06-07/Dec 22 (Sampling date)	01-02/Dec22 (Sampling date)	25-26/Nov22 (sampling date)	20-21/Nov22 (sampling date)	NAAQS	Test Method
			221225024 A (Lab Code)	221225040 A (Lab Code)	221225049 A (Lab Code)	221225085 A (Lab Code)		
7	Ozone as O <sub>3</sub>	µg/m <sup>3</sup>	14	16	12	10	100 (08 Hourly)	IS 5182 (Pt-09)
8	Lead as Pb	µg/m <sup>3</sup>	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	BDL(DL-2.2)	01 (24 Hourly)	IS 5182 (Pt-22)
9	Nickel as Ni	ng/m <sup>3</sup>	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	BDL(DL-1.1)	20 (Annual)	ELPL/III/SOP/28
10	Arsenic as As	ng/m <sup>3</sup>	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	06 (Annual)	ELPL/III/SOP/28
11	Benzene	µg/m <sup>3</sup>	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	BDL(DL-1.0)	05 (Annual)	ELPL/III/SOP/30
12	Benzo(a)pyrene	ng/m <sup>3</sup>	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	01 (Annual)	ELPL/III/SOP/29

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(Vikash Kumar)

Authorized Signatory  
(SnehSmita)

***ANNEXURE - 7 – NOISE MODELLING  
REPORTS***

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# *Noise Modeling Report*

*For*

**Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur, Imphal Manipur**

---

---

**Submitted By :**

**ecosteps**  
**laboratory**

**Ecosteps Laboratory Pvt. Ltd.**

**Corporate Office & Laboratory D-79, Sector-6, Noida, U.P. 201301  
NABL Accreditation and MOEF&CC Approved Laboratory**

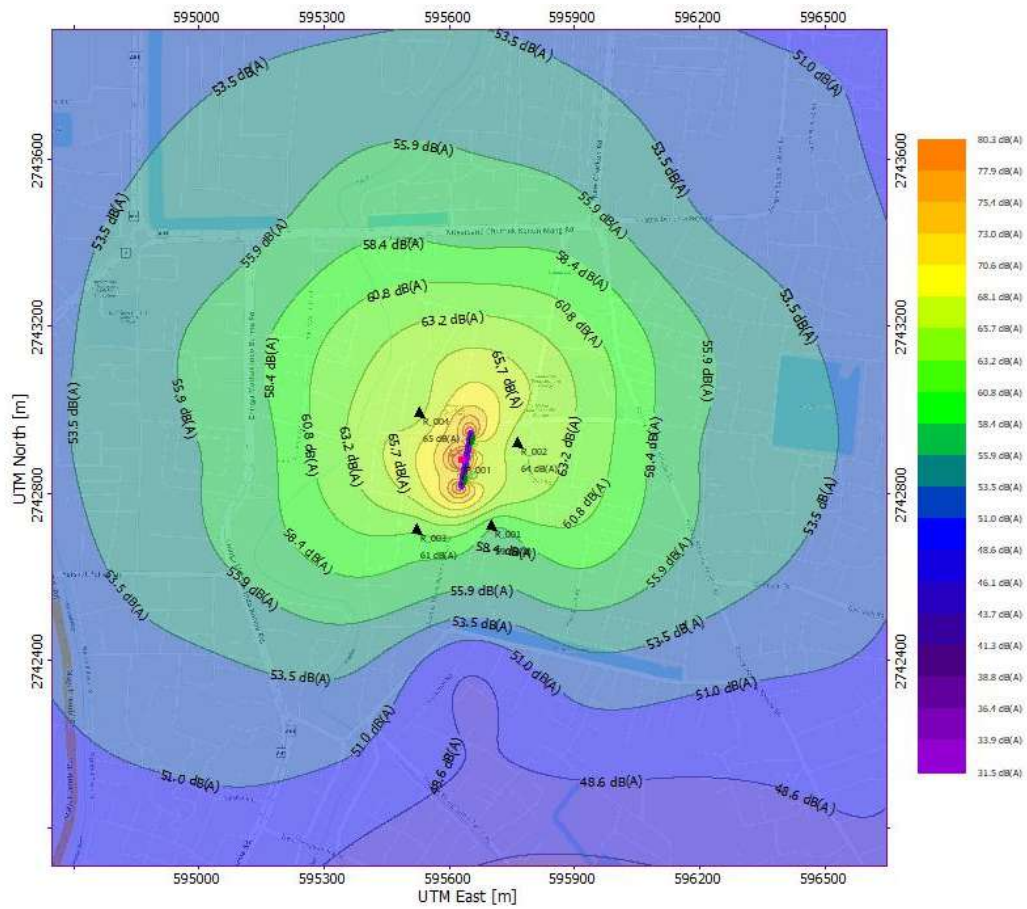
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<b>Location No.</b>	<b>Location Name</b>	<b>Page No.</b>
1.	Advanced Hospital	1
2.	Ahallup	3
3.	Central Agriculture University	5
4.	Prism Academic	7
5.	New Light Public School	9
6.	New Age Public School	11
7.	Shishu Niketan	13
8.	St. Joseph's School	15
9.	Herbert School	17
10.	Malom Mega High School	19
11.	St. Anthony High School	21
12.	RIMS	23
13.	Royal Academy	25
14.	Kongba Bazar	27
15.	Luwang Sangban	29
16.	Lamlong H.S.School	31



# Noise Modelling Results of the Improvement of roads of Greater Imphal

## 1. Advanced Hospital



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	595701	2742720	58.8	63	64.4
R_002	595765	2742919	64.3	63	66.7
R_003	595524	2742712	61.3	63	65.2
R_004	595529	2742990	65.3	63	67.3

---

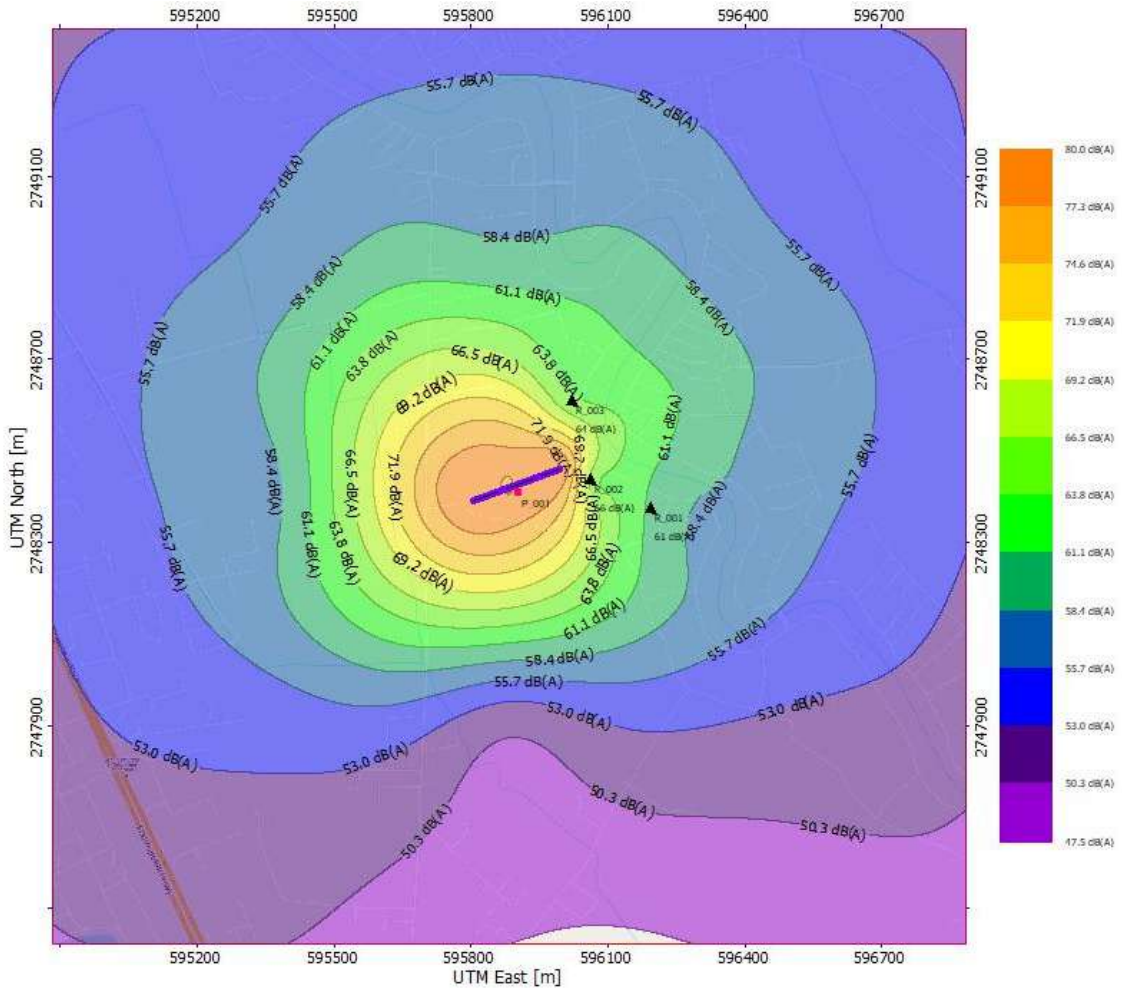
### Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Advanced Hospital.dwp

Envitrans dhvaniPRO v

2. Ahallup



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	596193	2748372	60.6	63.2	65.1
R_002	596063	2748435	65.8	63.2	67.7
R_003	596022	2748608	64.5	63.2	66.9

---

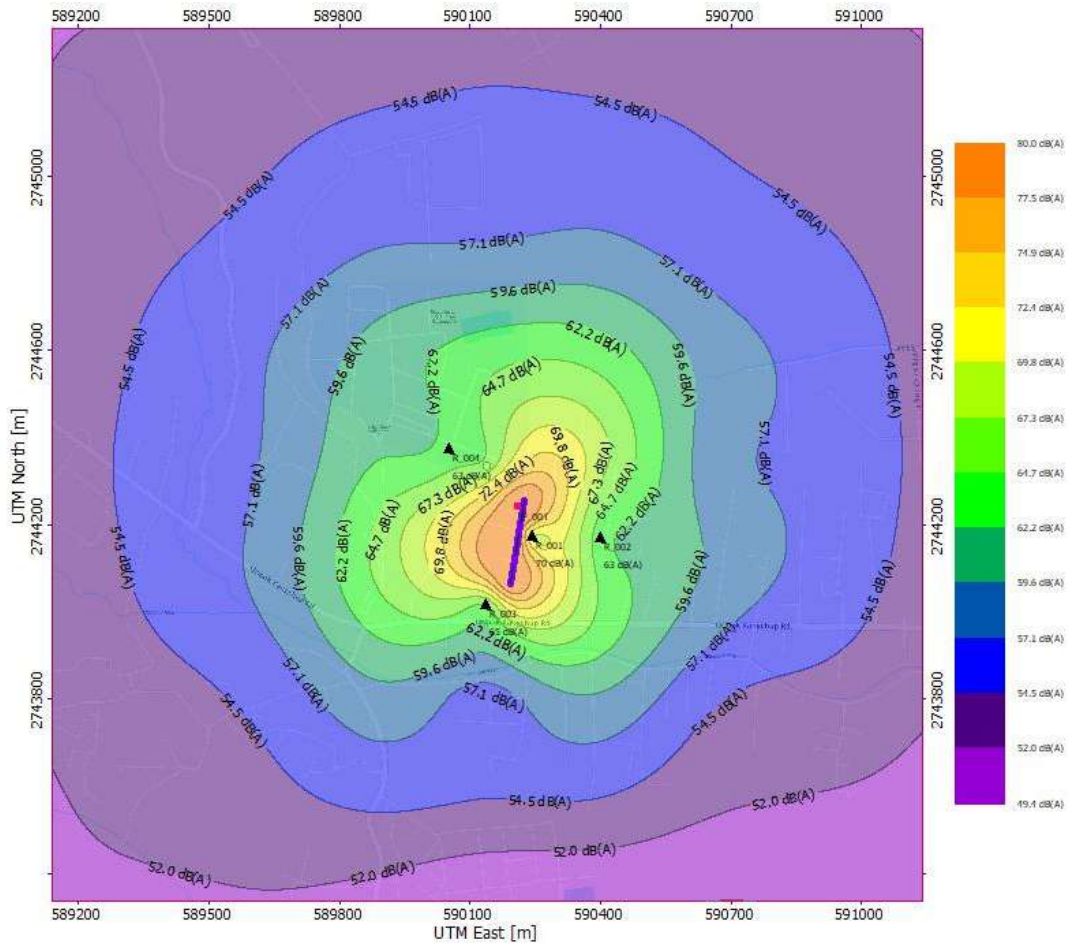
Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Ahallup.dwp

Envitrans dhvaniPRO v

### 3. Central Agriculture University



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	590245	2744170	70.3	64.6	71.4
R_002	590400	2744167	63.4	64.6	67.0
R_003	590136	2744013	64.6	64.6	67.6
R_004	590053	2744371	63.2	64.6	67.0

---

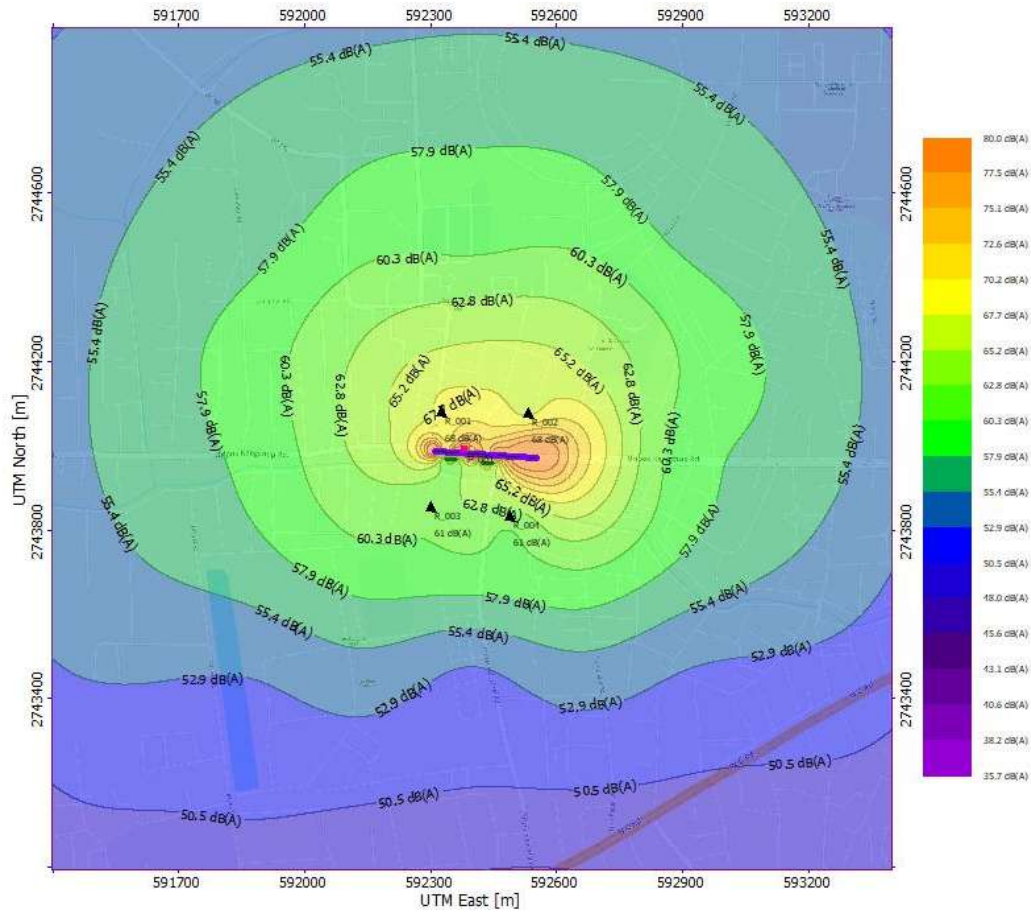
### Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Central Agriculture University.dwp

Envitrans dhvaniPRO v

### 4. Prism Academic



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	592325	2744077	68	68.6	71.3
R_002	592534	2744073	67.7	68.6	71.2
R_003	592300	2743852	61.2	68.6	69.3
R_004	592490	2743831	61.4	68.6	69.4

---

### Remarks:

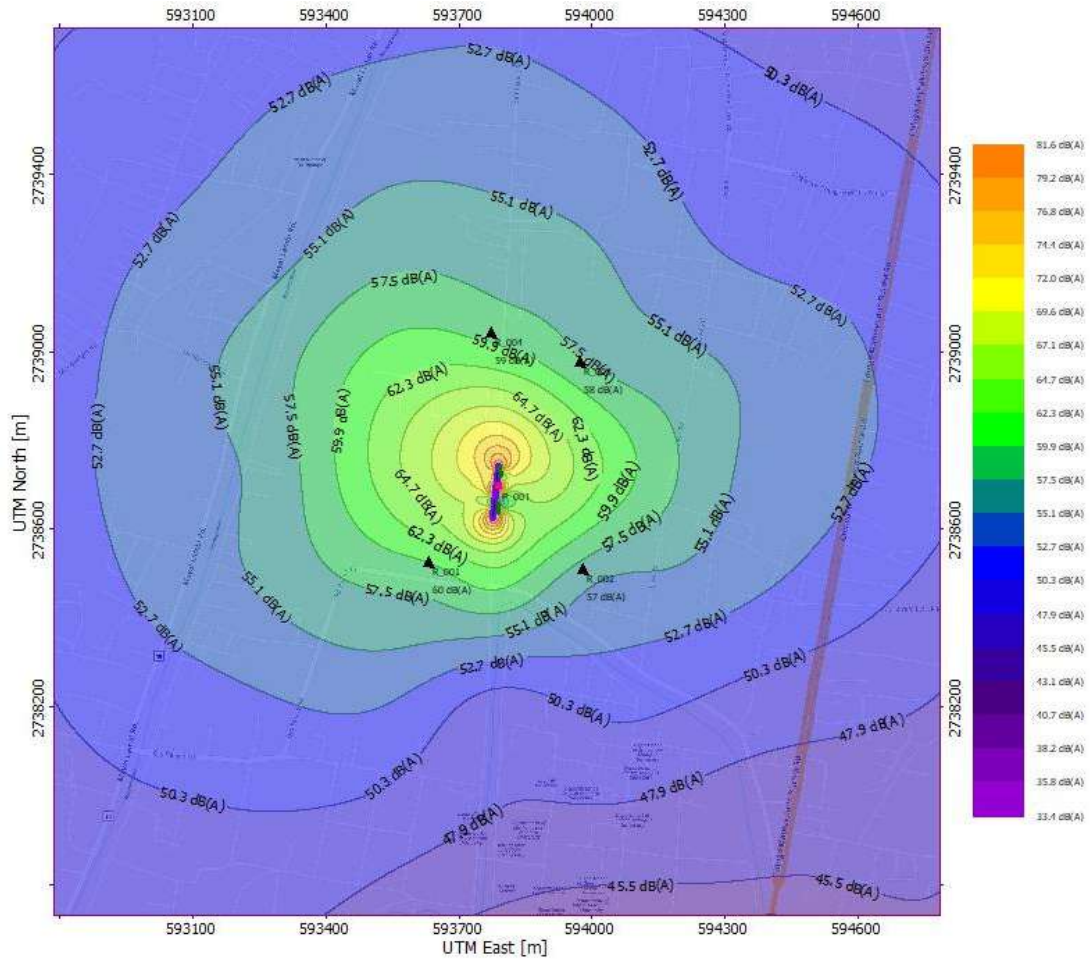
1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Prism Academic.dwp

Envitrans dhvaniPRO v



### 5. New Light Public School



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant^
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	593633	2738524	59.9	61.6	63.8
R_002	593980	2738508	56.6	61.6	62.8
R_003	593975	2738976	57.9	61.6	63.1
R_004	593772	2739039	59.2	61.6	63.6

---

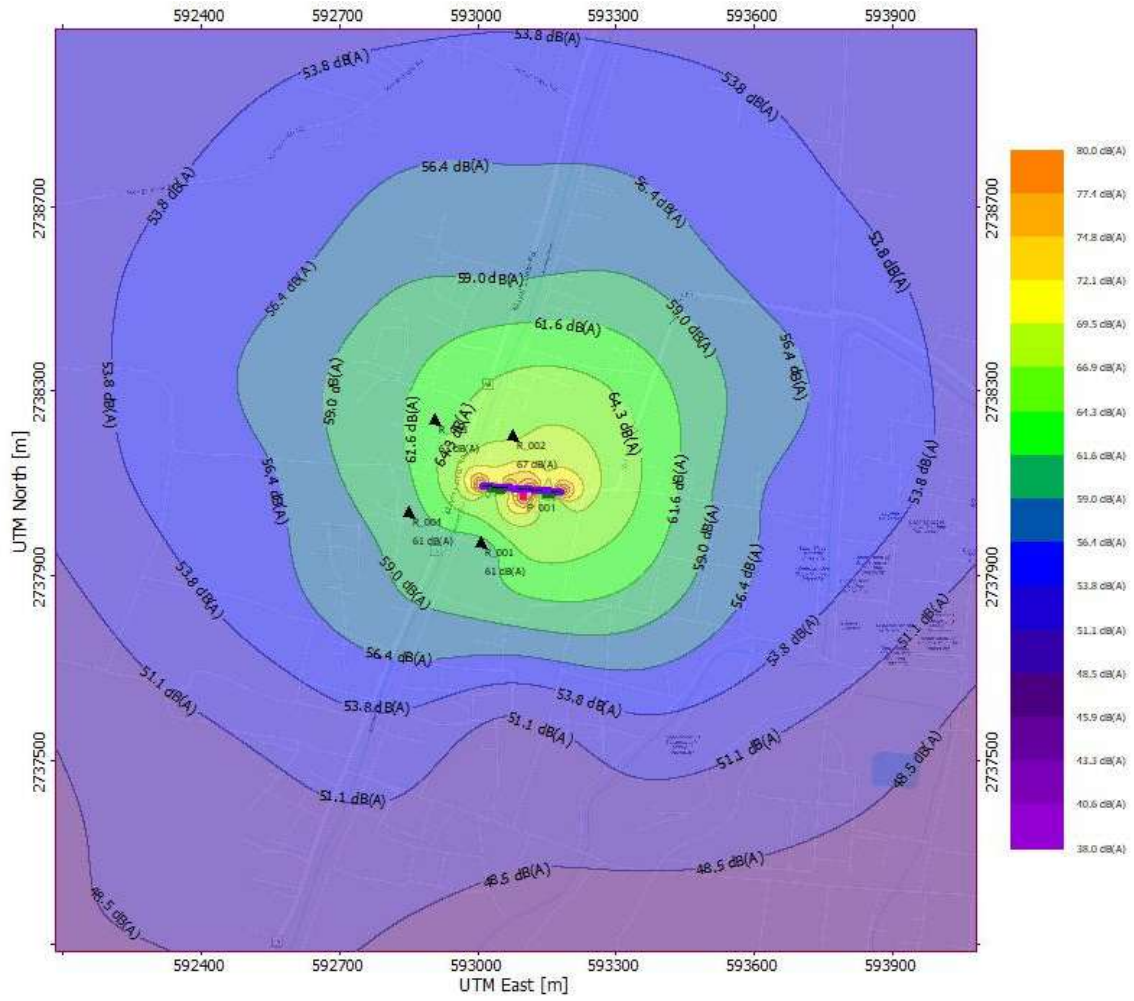
### Remarks:

1. Summaries of highest values by receptor
2. ^Predicted plus background level

Project File: D:\modelling\Noise modelling\New Light Public School.dwp

Envitrans dhvaniPRO v

### 6. New Age Public School



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	593007	2737968	60.7	60.4	63.6
R_002	593078	2738202	66.6	60.4	67.5
R_003	592909	2738235	63	60.4	64.9
R_004	592852	2738035	60.6	60.4	63.5

---

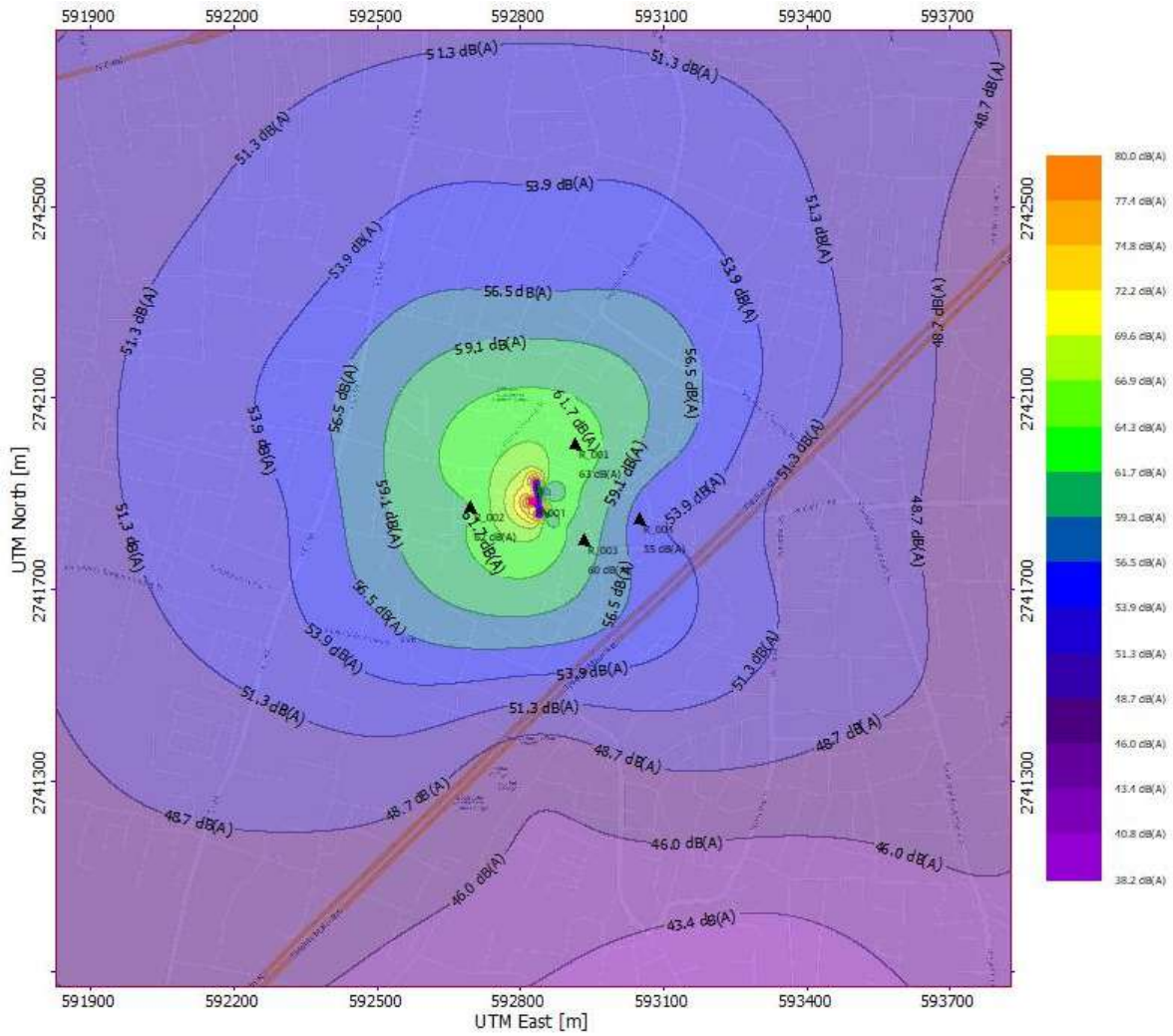
### Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\New Age Public School.dwp

Envitrans dhvaniPRO v

### 7. Shishu Niketan



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	592915	2742000	63.1	66.1	67.9
R_002	592696	2741869	61.9	66.1	67.5
R_003	592935	2741799	60.4	66.1	67.1
R_004	593050	2741844	55.3	66.1	66.4

---

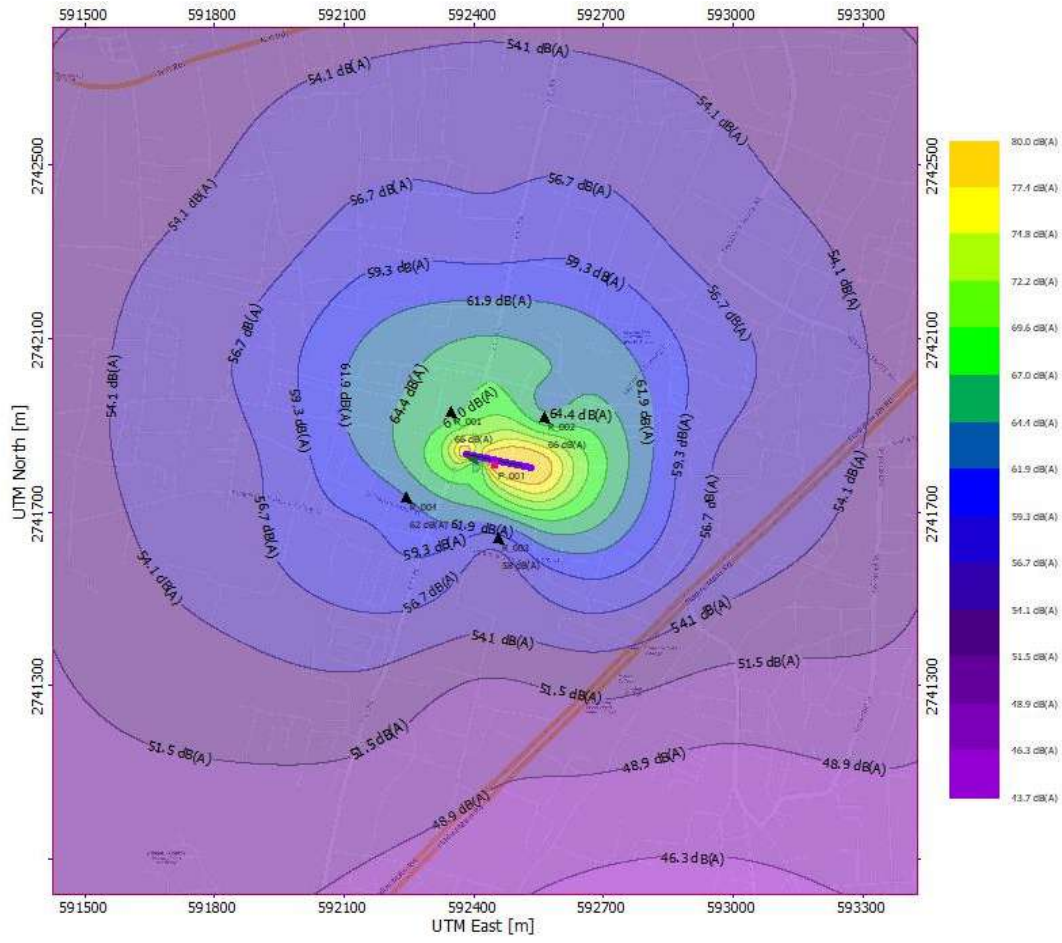
### Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Shishu Niketan.dwp

Envitrans dhvaniPRO v

### 8. St. Joseph's School



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	592349	2741927	66	63.4	67.9
R_002	592564	2741915	65.6	63.4	67.6
R_003	592456	2741635	58.1	63.4	64.5
R_004	592243	2741730	61.6	63.4	65.6

---

### Remarks:

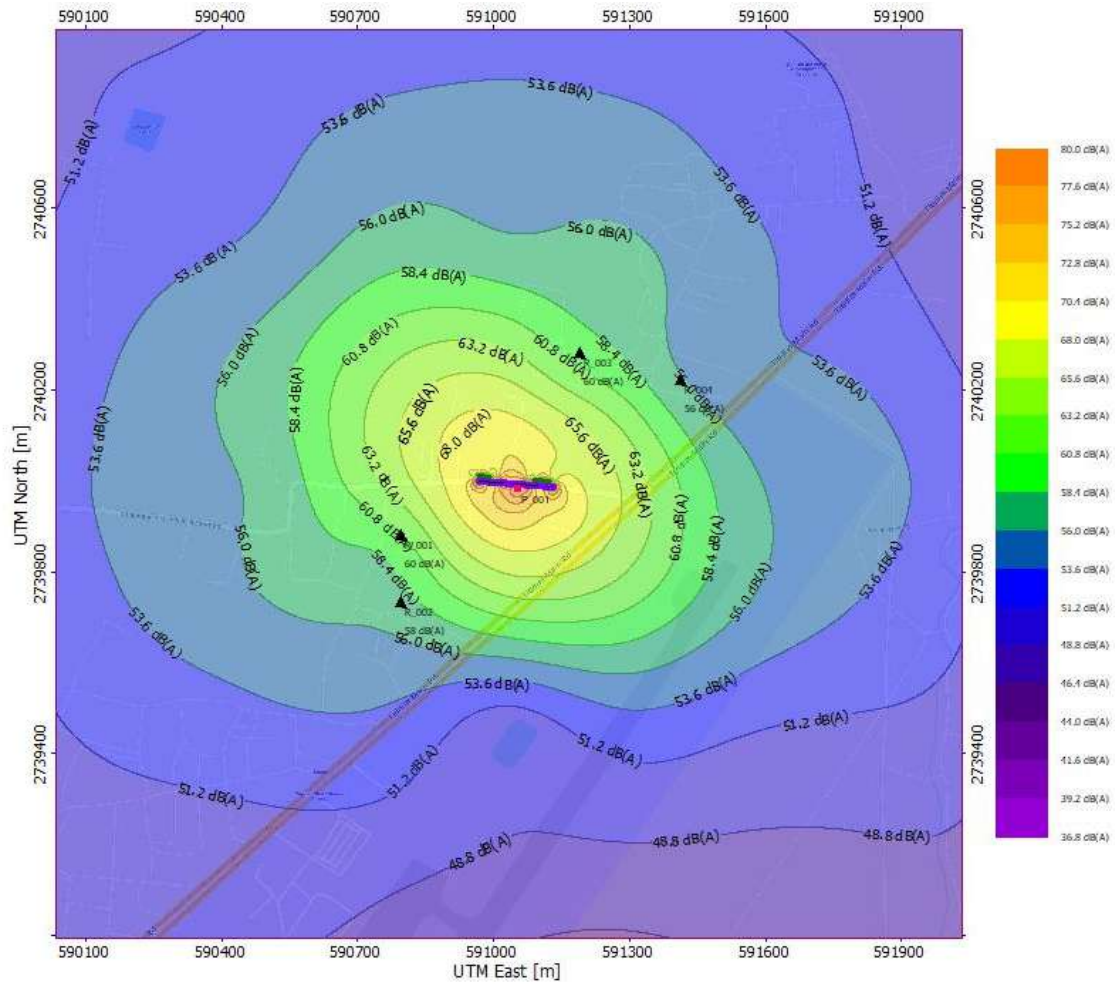
1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\St. Joseph's School.dwp

Envitrans dhwaniPRO v



### 9. Herbert School



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	590797	2739878	60.5	62	64.3
R_002	590796	2739730	57.6	62	63.3
R_003	591192	2740279	59.8	62	64.1
R_004	591413	2740219	56.3	62	63.0

---

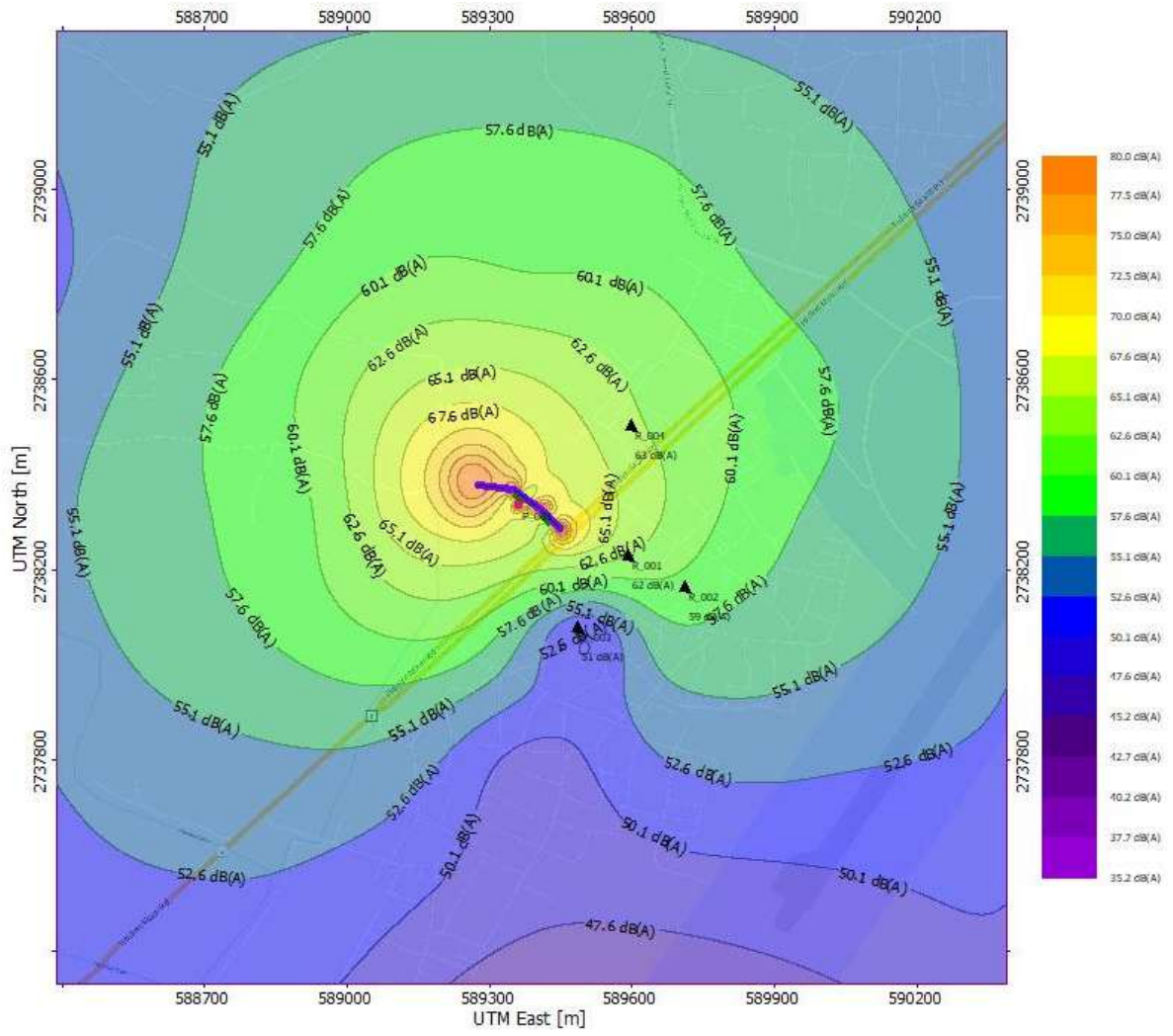
### Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Herbert School.dwp

Envitrans dhvaniPRO v

### 10. Malom Mega High School



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	589593	2738226	62.3	63.8	66.1
R_002	589713	2738163	59.3	63.8	65.1
R_003	589487	2738076	50.9	63.8	64.0
R_004	589599	2738500	63.1	63.8	66.5

---

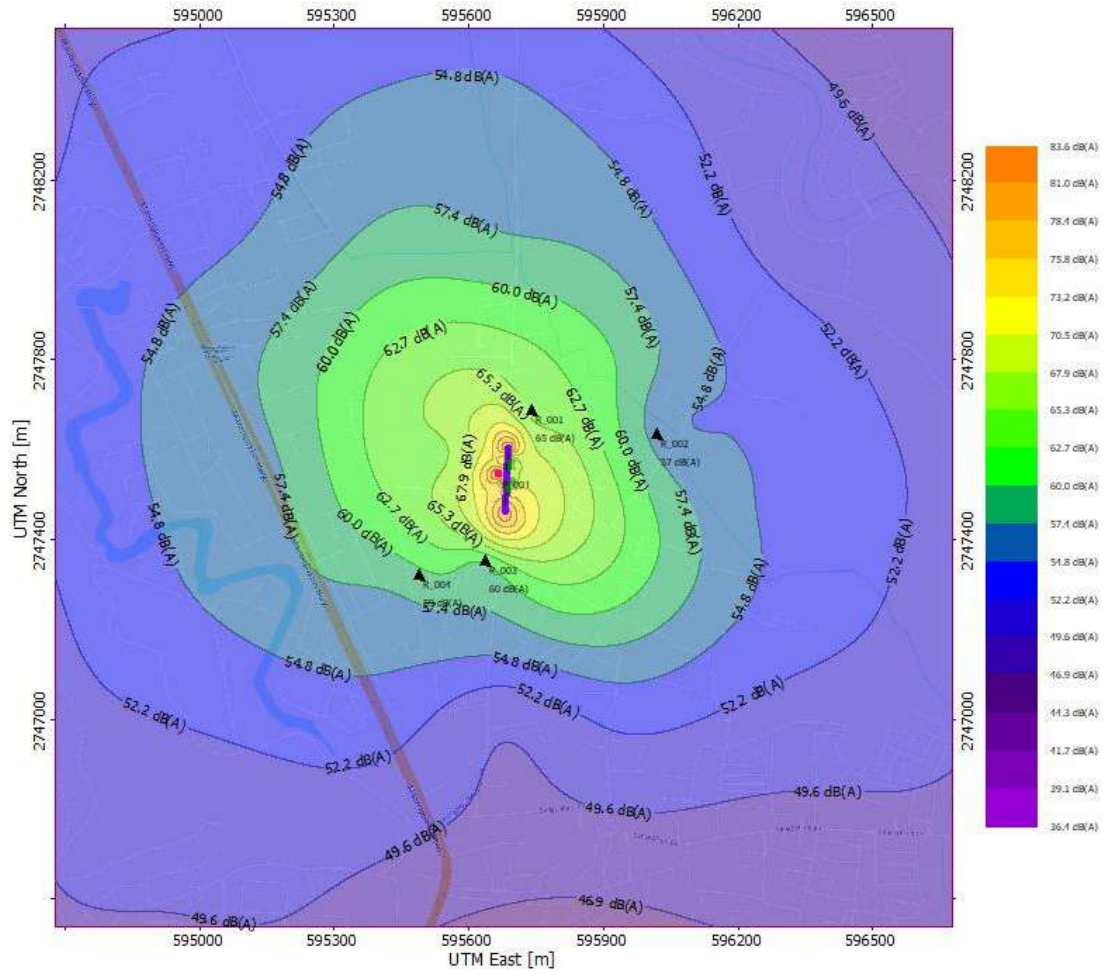
Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Malom Mega High School.dwp

Envitrans dhvaniPRO v

### 11. St. Anthony High School



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	595740	2747684	64.7	59.4	65.8
R_002	596020	2747631	56.5	59.4	61.2
R_003	595637	2747350	60.4	59.4	62.9
R_004	595489	2747317	59.3	59.4	62.3

---

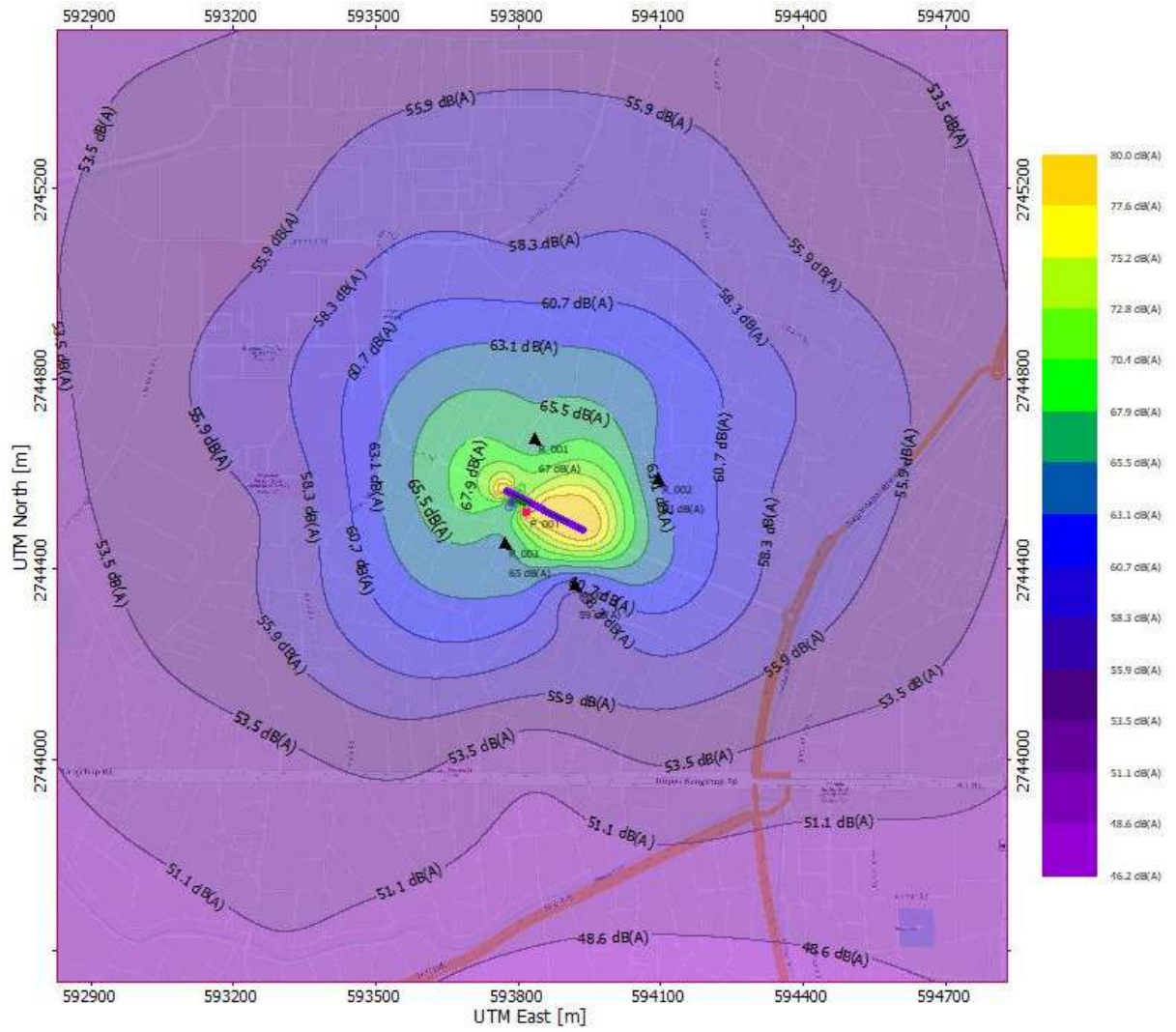
### Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\St. Anthony High School.dwp

Envitrans dhvaniPRO v

### 12. RIMS



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	593834	2744672	66.5	67.6	70.1
R_002	594096	2744587	62.8	67.6	68.9
R_003	593774	2744450	65.1	67.6	69.5
R_004	593920	2744363	59.2	67.6	68.2

---

### Remarks:

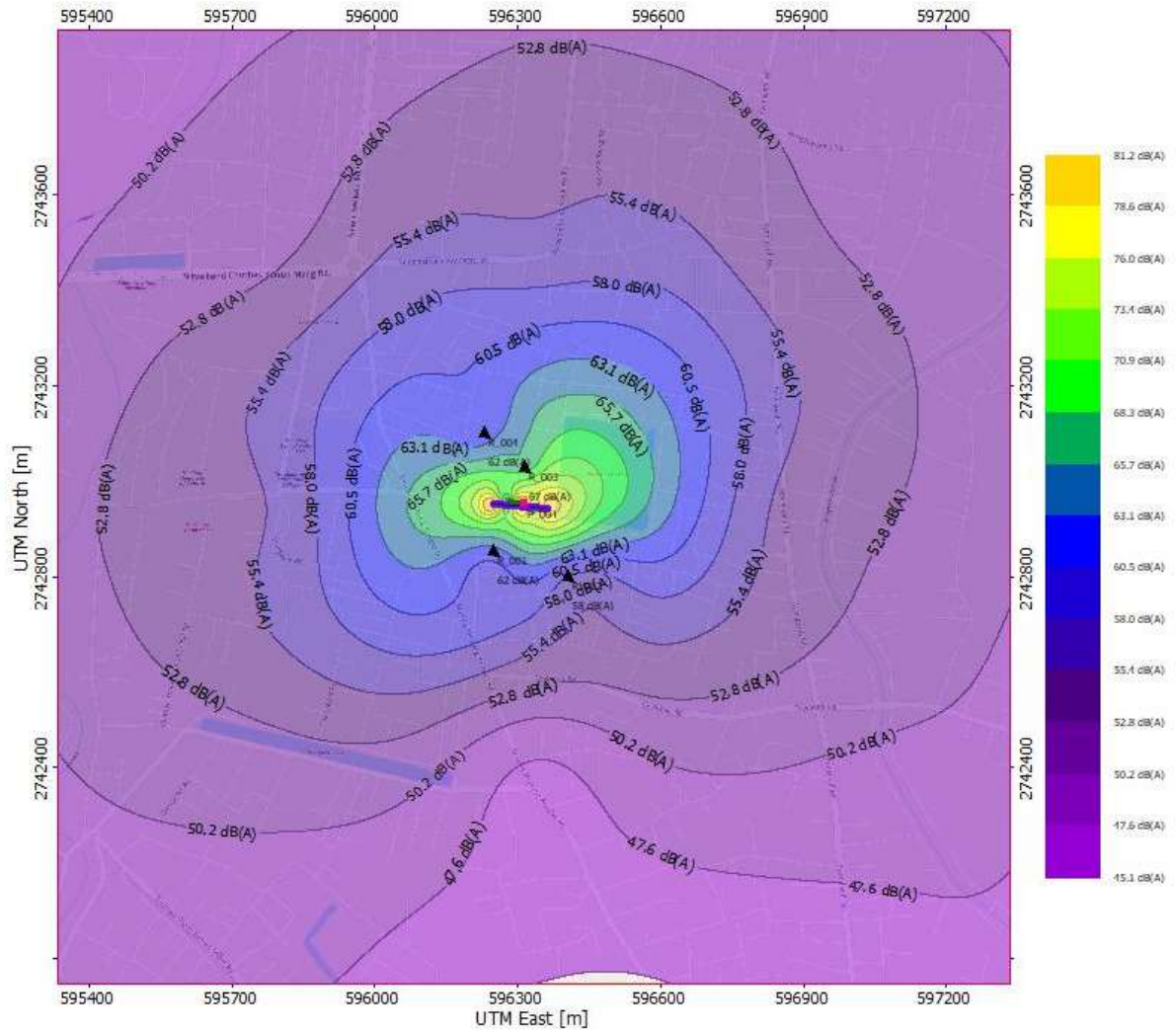
1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\RIMS.dwp

Envitrans dhvaniPRO v



### 13. Royal Academy



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	596250	2742851	61.9	65.4	67.0
R_002	596407	2742800	57.9	65.4	66.1
R_003	596316	2743028	67.4	65.4	69.5
R_004	596231	2743099	62	65.4	67.0

---

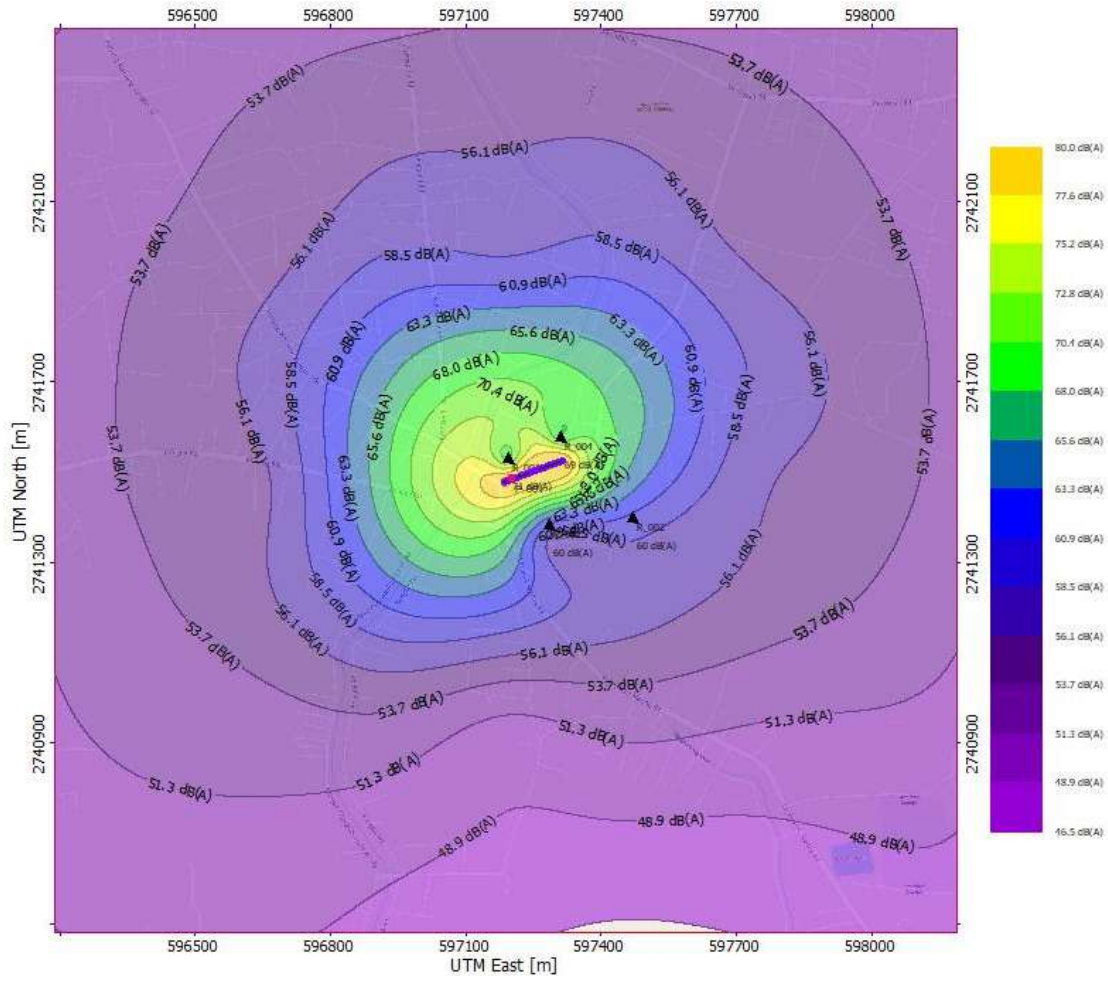
### Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Royal Academy.dwp

Envitrans dhvaniPRO v

### 14. Kongba Bazar



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	597286	2741381	60.5	64.7	66.1
R_002	597472	2741395	60.2	64.7	66.0
R_003	597196	2741528	70.8	64.7	71.7
R_004	597311	2741575	69.3	64.7	70.6

---

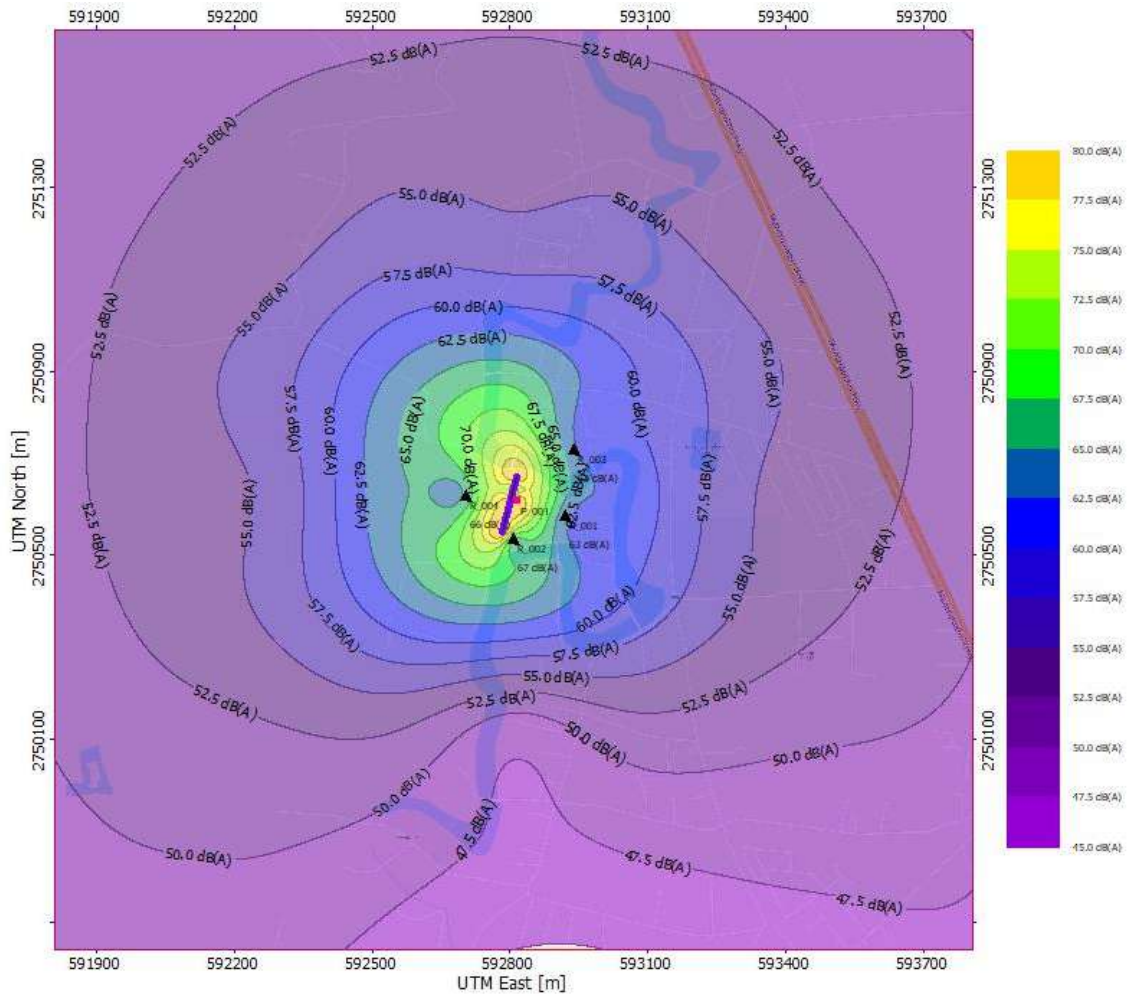
### Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Kongba Bazar.dwp

Envitrans dhvaniPRO v

### 15. Luwang Sangban



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	592920	2750581	63.1	63.8	66.5
R_002	592807	2750532	66.8	63.8	68.5
R_003	592941	2750726	62.9	63.8	66.4
R_004	592703	2750627	65.8	63.8	67.9

---

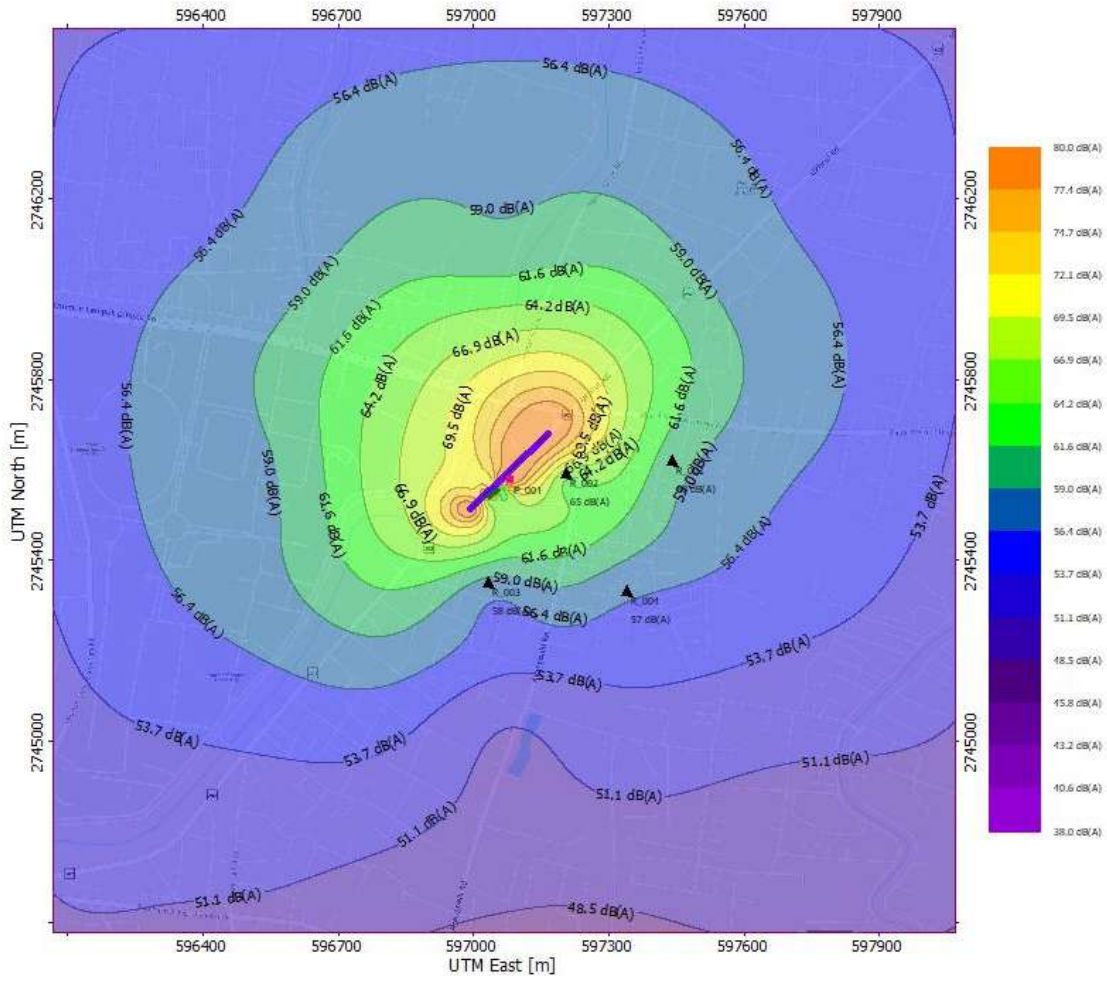
### Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Luwang sangban.dwp

Envitrans dhvaniPRO v

### 16. Lamlong H.S.School



## SUMMARY REPORT FOR DISCRETE RECEPTOR POINTS

---

Title : Sound Propagation Model Run  
 Subtitle : Improvement of roads of Greater Imphal  
 Unit : dB(A)

---



---

Receptor ID	X-Coordinate	Y-Coordinate	Predicted Level	Baseline	Resultant <sup>^</sup>
Name	m	m	dB(A)	dB(A)	dB(A)
R_001	597440	2745618	60.1	66.9	67.7
R_002	597206	2745591	65.4	66.9	69.2
R_003	597032	2745349	58.1	66.9	67.4
R_004	597340	2745328	56.8	66.9	67.3

---

### Remarks:

1. Summaries of highest values by receptor
2. <sup>^</sup>Predicted plus background level

Project File: D:\modelling\Noise modelling\Lamlong H.S.School.dwp

Envitrans dhvaniPRO v



***ANNEXURE - 8 - BASELINE AMBIENT NOISE  
TEST REPORTS***

## TEST REPORT

Issued to

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225008 N  
Issue Date : 23/01/2023  
Your Reference : Email

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at Lamlong High Secondary School, Manipur from 21/11/2022 to 22/11/2022.

Type of sample	: Ambient Noise	Sample Registration Date	: 25/12/2022
Sampling Date	: 21/11/2022 to 22/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 26/12/2022
Quantity received	: 24 Hourly Sample	Sampling Method	: ELPL/III/SOP/37
Sample's Location	: Lamlong High Secondary School		

Location ANQ-01

(Page1of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	60.6	13	18:00 to 19:00	71.9
2	07:00 to 08:00	65.8	14	19:00 to 20:00	71.6
3	08:00 to 09:00	67.1	15	20:00 to 21:00	67.8
4	09:00 to 10:00	68.5	16	21:00 to 22:00	63.4
5	10:00 to 11:00	68.7	17	22:00 to 23:00	55.4
6	11:00 to 12:00	65.8	18	23:00 to 00:00	49.7
7	12:00 to 13:00	63.9	19	00:00 to 01:00	43.6
8	13:00 to 14:00	67.8	20	01:00 to 02:00	38.9
9	14:00 to 15:00	66.5	21	02:00 to 03:00	37.5
10	15:00 to 16:00	63.4	22	03:00 to 04:00	33.8
11	16:00 to 17:00	67.6	23	04:00 to 05:00	38.8
12	17:00 to 18:00	69.8	24	05:00 to 06:00	44.5

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	51.5	49.2
L <sub>50</sub>	dB(A)	42.7	40.3
L <sub>90</sub>	dB(A)	35.6	32.6
Leq	dB(A)	66.9	42.8
Av. Leq	dB(A)	55.0	

Standards for Ambient Noise As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225010 N  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at Luwang Sangban Haotabi, Manipur from 17/11/2022 to 18/11/2022.

<b>Type of sample</b>	: Ambient Noise	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 17/11/2022 to 18/11/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 26/12/2022
<b>Quantity received</b>	: 24 Hourly Sample	<b>Sampling Method</b>	: ELPL/III/SOP/37
<b>Sample's Location</b>	: Luwang Sangban Haotabi		

Location ANQ-02

(Page1of 1)

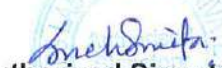
Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	58.6	13	18:00 to 19:00	63.1
2	07:00 to 08:00	62.9	14	19:00 to 20:00	64.5
3	08:00 to 09:00	66.8	15	20:00 to 21:00	58.1
4	09:00 to 10:00	69.7	16	21:00 to 22:00	55.7
5	10:00 to 11:00	68.2	17	22:00 to 23:00	50.4
6	11:00 to 12:00	66.5	18	23:00 to 00:00	45.2
7	12:00 to 13:00	63.2	19	00:00 to 01:00	40.8
8	13:00 to 14:00	66.8	20	01:00 to 02:00	36.5
9	14:00 to 15:00	63.9	21	02:00 to 03:00	32.7
10	15:00 to 16:00	62.6	22	03:00 to 04:00	39.5
11	16:00 to 17:00	64.5	23	04:00 to 05:00	44.8
12	17:00 to 18:00	65.3	24	05:00 to 06:00	49.3

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	49.6	48.6
L <sub>50</sub>	dB(A)	42.4	39.4
L <sub>90</sub>	dB(A)	37.3	31.5
Leq	dB(A)	63.8	42.4
Av. Leq	dB(A)	53.3	

Standards for Ambient Noise As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
Checked By  
(VIKASH KUMAR)

  
Authorized Signatory  
(SNEHA SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225064 N  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at Kongba Bazar, Manipur from 21/11/2022 to 22/11/2022.

<b>Type of sample</b>	: Ambient Noise	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 21/11/2022 to 22/11/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 26/12/2022
<b>Quantity received</b>	: 24 Hourly Sample	<b>Sampling Method</b>	: ELPL/III/SOP/37
<b>Sample's Location</b>	: Kongba Bazar		

Location ANQ-03

(Page1of 1)


Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	60.1	13	18:00 to 19:00	66.5
2	07:00 to 08:00	63.9	14	19:00 to 20:00	64.2
3	08:00 to 09:00	68.5	15	20:00 to 21:00	60.7
4	09:00 to 10:00	69.3	16	21:00 to 22:00	58.4
5	10:00 to 11:00	67.4	17	22:00 to 23:00	52.7
6	11:00 to 12:00	64.9	18	23:00 to 00:00	47.6
7	12:00 to 13:00	62.4	19	00:00 to 01:00	41.5
8	13:00 to 14:00	66.3	20	01:00 to 02:00	37.8
9	14:00 to 15:00	65.7	21	02:00 to 03:00	35.7
10	15:00 to 16:00	63.5	22	03:00 to 04:00	43.6
11	16:00 to 17:00	66.1	23	04:00 to 05:00	48.5
12	17:00 to 18:00	67.5	24	05:00 to 06:00	55.7

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	52.1	49.8
L <sub>50</sub>	dB(A)	45.3	41.6
L <sub>90</sub>	dB(A)	40.5	35.2
Leq	dB(A)	64.7	45.4
Av. Leq	dB(A)	55.2	

Standards for Ambient Noise			
As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

  
**Checked By**  
(VIKASH KUMAR)

  
**Authorized Signatory**  
(SNEH SMITA)

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225066 N  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at Royal Academy of Science, Manipur from 21/11/2022 to 22/11/2022.

<b>Type of sample</b>	: Ambient Noise	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 21/11/2022 to 22/11/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 26/12/2022
<b>Quantity received</b>	: 24 Hourly Sample	<b>Sampling Method</b>	: ELPL/III/SOP/37
<b>Sample's Location</b>	: Royal Academy of Science		

Location ANQ-04

(Page1of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	59.3	13	18:00 to 19:00	68.7
2	07:00 to 08:00	64.5	14	19:00 to 20:00	67.8
3	08:00 to 09:00	67.3	15	20:00 to 21:00	65.9
4	09:00 to 10:00	69.4	16	21:00 to 22:00	61.3
5	10:00 to 11:00	67.7	17	22:00 to 23:00	58.3
6	11:00 to 12:00	65.2	18	23:00 to 00:00	51.5
7	12:00 to 13:00	61.3	19	00:00 to 01:00	47.6
8	13:00 to 14:00	65.4	20	01:00 to 02:00	39.3
9	14:00 to 15:00	65.9	21	02:00 to 03:00	38.8
10	15:00 to 16:00	62.5	22	03:00 to 04:00	38.1
11	16:00 to 17:00	65.6	23	04:00 to 05:00	45.6
12	17:00 to 18:00	68.4	24	05:00 to 06:00	50.5

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	60.5	50.4
L <sub>50</sub>	dB(A)	44.3	42.2
L <sub>90</sub>	dB(A)	40.5	36.4
Leq	dB(A)	65.4	46.2
Av.Leq	dB(A)	56.0	

Standards for Ambient Noise As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
**In JV with M/s K & J Projects Private Limited**  
**Ward No-11, Mamang Leikai Bishanpur Bazar,**  
**Ngaikhong Near Ngaikhong Parking**  
**Bishanpur, Manipur**

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225068 N  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at RIMS Hospital, Manipur from 17/11/2022 to 18/11/2022.

<b>Type of sample</b>	: Ambient Noise	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 17/11/2022 to 18/11/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 28/12/2022
<b>Quantity received</b>	: 24 Hourly Sample	<b>Sampling Method</b>	: ELPL/III/SOP/37
<b>Sample's Location</b>	: RIMS Hospital		

Location ANQ-05

(Page1of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	59.5	13	18:00 to 19:00	72.5
2	07:00 to 08:00	64.2	14	19:00 to 20:00	69.8
3	08:00 to 09:00	67.7	15	20:00 to 21:00	68.3
4	09:00 to 10:00	70.5	16	21:00 to 22:00	64.3
5	10:00 to 11:00	68.6	17	22:00 to 23:00	60.6
6	11:00 to 12:00	68.4	18	23:00 to 00:00	58.9
7	12:00 to 13:00	65.7	19	00:00 to 01:00	56.7
8	13:00 to 14:00	68.9	20	01:00 to 02:00	54.5
9	14:00 to 15:00	68.1	21	02:00 to 03:00	52.8
10	15:00 to 16:00	65.3	22	03:00 to 04:00	54.1
11	16:00 to 17:00	68.2	23	04:00 to 05:00	55.8
12	17:00 to 18:00	71.3	24	05:00 to 06:00	58.4

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	71.19	51.4
L <sub>50</sub>	dB(A)	68.5	42.9
L <sub>90</sub>	dB(A)	62.27	36.8
Leq	dB(A)	67.6	56.5
Av.Leq	dB(A)	62.2	

Standards for Ambient Noise			
As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*V. Kumar*  
**Checked By**  
(VIKASH KUMAR)

*Sneh Smita*  
**Authorized Signatory**  
(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225070 N  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ambient Noise Monitoring was monitored at St. Anthony High School, Manipur from 17/11/2022 to 18/11/2022.

Type of sample	: Ambient Noise	Sample Registration Date	: 25/12/2022
Sampling Date	: 17/11/2022 to 18/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 28/12/2022
Quantity received	: 24 Hourly Sample	Sampling Method	: ELPL/III/SOP/37
Sample's Location	: St. Anthony High School		

Location ANQ-06

(Page1of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	53.2	13	18:00 to 19:00	60.7
2	07:00 to 08:00	54.8	14	19:00 to 20:00	57.5
3	08:00 to 09:00	58.9	15	20:00 to 21:00	54.6
4	09:00 to 10:00	62.7	16	21:00 to 22:00	50.5
5	10:00 to 11:00	63.5	17	22:00 to 23:00	47.6
6	11:00 to 12:00	60.6	18	23:00 to 00:00	43.7
7	12:00 to 13:00	60.1	19	00:00 to 01:00	40.6
8	13:00 to 14:00	64.8	20	01:00 to 02:00	37.5
9	14:00 to 15:00	63.5	21	02:00 to 03:00	37.1
10	15:00 to 16:00	59.8	22	03:00 to 04:00	38.5
11	16:00 to 17:00	63.1	23	04:00 to 05:00	42.3
12	17:00 to 18:00	62.4	24	05:00 to 06:00	46.8

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	67.6	45.5
L <sub>50</sub>	dB(A)	59.5	38.6
L <sub>90</sub>	dB(A)	49.1	32.1
Leq	dB(A)	59.4	41.8
Av. Leq	dB(A)	50.8	

Standards for Ambient Noise As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225072 N  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at Malom Mega High School, Manipur from 18/11/2022 to 19/11/2022.

<b>Type of sample</b>	: Ambient Noise	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 18/11/2022 to 19/11/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 28/12/2022
<b>Quantity received</b>	: 24 Hourly Sample	<b>Sampling Method</b>	: ELPL/III/SOP/37
<b>Sample's Location</b>	: Malom Mega High School		

Location ANQ-07

(Page1of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	59.9	13	18:00 to 19:00	64.7
2	07:00 to 08:00	63.5	14	19:00 to 20:00	63.5
3	08:00 to 09:00	66.3	15	20:00 to 21:00	63.1
4	09:00 to 10:00	68.4	16	21:00 to 22:00	60.6
5	10:00 to 11:00	65.3	17	22:00 to 23:00	55.7
6	11:00 to 12:00	63.2	18	23:00 to 00:00	50.6
7	12:00 to 13:00	60.7	19	00:00 to 01:00	45.9
8	13:00 to 14:00	64.8	20	01:00 to 02:00	39.3
9	14:00 to 15:00	63.6	21	02:00 to 03:00	37.5
10	15:00 to 16:00	61.7	22	03:00 to 04:00	40.1
11	16:00 to 17:00	65.3	23	04:00 to 05:00	43.1
12	17:00 to 18:00	65.8	24	05:00 to 06:00	48.4

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	52.3	48.5
L <sub>50</sub>	dB(A)	45.1	40.8
L <sub>90</sub>	dB(A)	37.4	35.6
Leq	dB(A)	63.8	45.1
Av.Leq	dB(A)	54.6	

Standards for Ambient Noise As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663



## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
**In JV with M/s K & J Projects Private Limited**  
**Ward No-11, Mamang Leikai Bishanpur Bazar,**  
**Ngaikhong Near Ngaikhong Parking**  
**Bishanpur, Manipur**

**Doc No.** : ELPL/IV/QF/20  
**Amend. No. & Amend. Date** : 02 & 17.02.2018  
**Lab Reference No.** : 221225074 N  
**Issue Date** : 23/01/2023  
**Your Reference** : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at Herbert School, Manipur from 18/11/2022 to 19/11/2022.

<b>Type of sample</b>	: Ambient Noise	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 18/11/2022 to 19/11/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 28/12/2022
<b>Quantity received</b>	: 24 Hourly Sample	<b>Sampling Method</b>	: ELPL/III/SOP/37
<b>Sample's Location</b>	: Herbert School		

Location ANQ-08

(Page1of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	58.3	13	18:00 to 19:00	62.4
2	07:00 to 08:00	62.5	14	19:00 to 20:00	60.5
3	08:00 to 09:00	65.7	15	20:00 to 21:00	60.2
4	09:00 to 10:00	66.3	16	21:00 to 22:00	57.6
5	10:00 to 11:00	62.1	17	22:00 to 23:00	53.6
6	11:00 to 12:00	60.5	18	23:00 to 00:00	48.5
7	12:00 to 13:00	60.1	19	00:00 to 01:00	43.2
8	13:00 to 14:00	63.7	20	01:00 to 02:00	39.6
9	14:00 to 15:00	62.1	21	02:00 to 03:00	40.4
10	15:00 to 16:00	60.6	22	03:00 to 04:00	38.6
11	16:00 to 17:00	63.7	23	04:00 to 05:00	41.4
12	17:00 to 18:00	65.3	24	05:00 to 06:00	46.3

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	70.2	50.2
L <sub>50</sub>	dB(A)	62.4	39.6
L <sub>90</sub>	dB(A)	49.1	34.5
Leq	dB(A)	62.0	44.0
Av. Leq	dB(A)	53.2	

Standards for Ambient Noise			
As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*V. Kumar*  
**Checked By**  
(VIKASH KUMAR)

*Sneh Smita*  
**Authorized Signatory**  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
**In JV with M/s K & J Projects Private Limited**  
**Ward No-11, Mamang Leikai Bishanpur Bazar,**  
**Ngaikhong Near Ngaikhong Parking**  
**Bishanpur, Manipur**

**Doc No.** : ELPL/IV/QF/20  
**Amend. No. & Amend. Date** : 02 & 17.02.2018  
**Lab Reference No.** : 221225076 N  
**Issue Date** : 23/01/2023  
**Your Reference** : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at St. Joseph's School, Manipur from 18/11/2022 to 19/11/2022.

<b>Type of sample</b>	: Ambient Noise	<b>Sample Registration Date</b>	: 25/12/2022
<b>Sampling Date</b>	: 18/11/2022 to 19/11/2022	<b>Analysis Starting Date</b>	: 25/12/2022
<b>Sampling Done by</b>	: Lab representative	<b>Analysis Completion Date</b>	: 28/12/2022
<b>Quantity received</b>	: 24 Hourly Sample	<b>Sampling Method</b>	: ELPL/III/SOP/37
<b>Sample's Location</b>	: St. Joseph's School		

Location ANQ-09

(Page1 of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	60.3	13	18:00 to 19:00	65.5
2	07:00 to 08:00	63.5	14	19:00 to 20:00	64.5
3	08:00 to 09:00	64.8	15	20:00 to 21:00	60.6
4	09:00 to 10:00	67.5	16	21:00 to 22:00	58.1
5	10:00 to 11:00	66.8	17	22:00 to 23:00	54.2
6	11:00 to 12:00	63.1	18	23:00 to 00:00	49.5
7	12:00 to 13:00	61.5	19	00:00 to 01:00	45.4
8	13:00 to 14:00	64.3	20	01:00 to 02:00	40.6
9	14:00 to 15:00	62.1	21	02:00 to 03:00	38.5
10	15:00 to 16:00	60.6	22	03:00 to 04:00	38.2
11	16:00 to 17:00	64.8	23	04:00 to 05:00	43.8
12	17:00 to 18:00	66.2	24	05:00 to 06:00	48.3

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	68.9	49.5
L <sub>50</sub>	dB(A)	63.5	41.4
L <sub>90</sub>	dB(A)	57.8	36.1
Leq	dB(A)	63.4	44.8
Av.Leq	dB(A)	54.3	

Standards for Ambient Noise As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*V. Kumar*  
**Checked By**  
(VIKASH KUMAR)

*Sneh Smita*  
**Authorized Signatory**  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225078 N  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ambient Noise Monitoring was monitored at Shishu Nistha Niketan, Manipur from 18/11/2022 to 19/11/2022.

Type of sample	: Ambient Noise	Sample Registration Date	: 25/12/2022
Sampling Date	: 18/11/2022 to 19/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 30/12/2022
Quantity received	: 24 Hourly Sample	Sampling Method	: ELPL/III/SOP/37
Sample's Location	: Shishu Nistha Niketan		

Location ANQ-10

(Page 1 of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	59.4	13	18:00 to 19:00	70.7
2	07:00 to 08:00	64.8	14	19:00 to 20:00	68.2
3	08:00 to 09:00	68.1	15	20:00 to 21:00	65.6
4	09:00 to 10:00	69.4	16	21:00 to 22:00	60.7
5	10:00 to 11:00	70.1	17	22:00 to 23:00	56.4
6	11:00 to 12:00	67.9	18	23:00 to 00:00	51.7
7	12:00 to 13:00	63.8	19	00:00 to 01:00	47.5
8	13:00 to 14:00	66.5	20	01:00 to 02:00	40.6
9	14:00 to 15:00	65.3	21	02:00 to 03:00	38.5
10	15:00 to 16:00	63.8	22	03:00 to 04:00	39.3
11	16:00 to 17:00	65.8	23	04:00 to 05:00	42.5
12	17:00 to 18:00	68.2	24	05:00 to 06:00	48.1

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	52.3	44.4
L <sub>50</sub>	dB(A)	45.6	40.5
L <sub>90</sub>	dB(A)	37.4	31.8
Leq	dB(A)	66.1	45.6
Av.Leq	dB(A)	56.0	

Standards for Ambient Noise As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225080 N  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at New Age public School, Manipur from 19/11/2022 to 20/11/2022.

Type of sample	: Ambient Noise	Sample Registration Date	: 25/12/2022
Sampling Date	: 19/11/2022 to 20/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 30/12/2022
Quantity received	: 24 Hourly Sample	Sampling Method	: ELPL/III/SOP/37
Sample's Location	: New Age public School		

Location ANQ-11

(Page1 of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	57.4	13	18:00 to 19:00	63.7
2	07:00 to 08:00	58.2	14	19:00 to 20:00	61.5
3	08:00 to 09:00	60.4	15	20:00 to 21:00	60.1
4	09:00 to 10:00	61.5	16	21:00 to 22:00	57.6
5	10:00 to 11:00	62.2	17	22:00 to 23:00	51.8
6	11:00 to 12:00	60.3	18	23:00 to 00:00	45.8
7	12:00 to 13:00	59.2	19	00:00 to 01:00	39.3
8	13:00 to 14:00	61.3	20	01:00 to 02:00	36.5
9	14:00 to 15:00	60.1	21	02:00 to 03:00	33.3
10	15:00 to 16:00	59.3	22	03:00 to 04:00	36.5
11	16:00 to 17:00	61.4	23	04:00 to 05:00	40.7
12	17:00 to 18:00	62.5	24	05:00 to 06:00	48.2

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	66.6	43.6
L <sub>50</sub>	dB(A)	60.5	40.2
L <sub>90</sub>	dB(A)	50.4	32.2
Leq	dB(A)	60.4	41.5
Av.Leq	dB(A)	51.1	

Standards for Ambient Noise As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

## TEST REPORT

Issued to

**M/s Rodic Consultants Private Limited**  
**In JV with M/s K & J Projects Private Limited**  
**Ward No-11, Mamang Leikai Bishanpur Bazar,**  
**Ngaikhong Near Ngaikhong Parking**  
**Bishanpur, Manipur**

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225082 N  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at New Light Public School, Manipur from 19/11/2022 to 20/11/2022.

Type of sample	: Ambient Noise	Sample Registration Date	: 25/12/2022
Sampling Date	: 19/11/2022 to 20/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 30/12/2022
Quantity received	: 24 Hourly Sample	Sampling Method	: ELPL/III/SOP/37
Sample's Location	: New Light Public School		

Location ANQ-12

(Page 1 of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	56.4	13	18:00 to 19:00	64.9
2	07:00 to 08:00	58.9	14	19:00 to 20:00	63.1
3	08:00 to 09:00	62.4	15	20:00 to 21:00	59.4
4	09:00 to 10:00	63.2	16	21:00 to 22:00	55.7
5	10:00 to 11:00	63.8	17	22:00 to 23:00	50.5
6	11:00 to 12:00	62.5	18	23:00 to 00:00	43.7
7	12:00 to 13:00	59.1	19	00:00 to 01:00	38.5
8	13:00 to 14:00	63.1	20	01:00 to 02:00	32.6
9	14:00 to 15:00	62.3	21	02:00 to 03:00	30.5
10	15:00 to 16:00	60.1	22	03:00 to 04:00	36.5
11	16:00 to 17:00	64.1	23	04:00 to 05:00	40.6
12	17:00 to 18:00	66.8	24	05:00 to 06:00	50.4

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	70.6	42.5
L <sub>50</sub>	dB(A)	61.7	37.2
L <sub>90</sub>	dB(A)	50.4	31.1
Leq	dB(A)	61.6	40.4
Av. Leq	dB(A)	51.2	

Standards for Ambient Noise As per Noise Pollution (Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

**Checked By**  
(VIKASH KUMAR)

**Authorized Signatory**  
(SNEH SMITA)

Laboratory: D-79, Ground Floor, Sec-6, Noida-201301, Uttar Pradesh (India)  
Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

## TEST REPORT

Issued to

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225084 N  
Issue Date : 23/01/2023  
Your Reference : Email

**M/s Rodic Consultants Private Limited**  
**In JV with M/s K & J Projects Private Limited**  
**Ward No-11, Mamang Leikai Bishanpur Bazar,**  
**Ngaikhong Near Ngaikhong Parking**  
**Bishanpur, Manipur**

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at Prism Academy, Manipur from 20/11/2022 to 21/11/2022.

Type of sample	: Ambient Noise	Sample Registration Date	: 25/12/2022
Sampling Date	: 20/11/2022 to 21/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 30/12/2022
Quantity received	: 24 Hourly Sample	Sampling Method	: ELPL/III/SOP/37
Sample's Location	: Prism Academy		

Location ANQ-13

(Page 1 of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	61.5	13	18:00 to 19:00	72.9
2	07:00 to 08:00	66.2	14	19:00 to 20:00	73.4
3	08:00 to 09:00	70.4	15	20:00 to 21:00	67.8
4	09:00 to 10:00	73.6	16	21:00 to 22:00	64.5
5	10:00 to 11:00	72.4	17	22:00 to 23:00	56.4
6	11:00 to 12:00	69.6	18	23:00 to 00:00	50.5
7	12:00 to 13:00	66.5	19	00:00 to 01:00	45.3
8	13:00 to 14:00	69.2	20	01:00 to 02:00	42.5
9	14:00 to 15:00	67.5	21	02:00 to 03:00	40.6
10	15:00 to 16:00	63.9	22	03:00 to 04:00	41.7
11	16:00 to 17:00	67.2	23	04:00 to 05:00	45.5
12	17:00 to 18:00	71.4	24	05:00 to 06:00	48.5

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	52.3	43.8
L <sub>50</sub>	dB(A)	46.1	41.3
L <sub>90</sub>	dB(A)	37.4	33.8
Leq	dB(A)	68.6	46.4
Av.Leq	dB(A)	57.7	

Standards for Ambient Noise As per Noise Pollution (Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225086 N  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ambient Noise Monitoring was monitored at Central Agriculture University, Manipur from 20/11/2022 to 21/11/2022.

Type of sample	: Ambient Noise	Sample Registration Date	: 25/12/2022
Sampling Date	: 20/11/2022 to 21/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 30/12/2022
Quantity received	: 24 Hourly Sample	Sampling Method	: ELPL/III/SOP/37
Sample's Location	: Central Agriculture University		

Location ANQ-14

(Page1 of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	60.3	13	18:00 to 19:00	68.4
2	07:00 to 08:00	64.9	14	19:00 to 20:00	66.5
3	08:00 to 09:00	65.6	15	20:00 to 21:00	63.5
4	09:00 to 10:00	66.4	16	21:00 to 22:00	60.1
5	10:00 to 11:00	67.8	17	22:00 to 23:00	55.4
6	11:00 to 12:00	64.3	18	23:00 to 00:00	50.1
7	12:00 to 13:00	61.4	19	00:00 to 01:00	43.6
8	13:00 to 14:00	65.3	20	01:00 to 02:00	40.1
9	14:00 to 15:00	64.6	21	02:00 to 03:00	35.2
10	15:00 to 16:00	62.4	22	03:00 to 04:00	40.4
11	16:00 to 17:00	64.7	23	04:00 to 05:00	44.8
12	17:00 to 18:00	67.6	24	05:00 to 06:00	49.7

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	52.3	44.2
L <sub>50</sub>	dB(A)	44.9	39.6
L <sub>90</sub>	dB(A)	37.4	32.4
Leq	dB(A)	64.6	44.9
Av. Leq	dB(A)	54.9	

Standards for Ambient Noise As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225091 N  
Issue Date : 23/01/2023  
Your Reference : Email

Project – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

Sample Particulars: Ambient Noise Monitoring was monitored at Ahallup, Manipur from 07/12/2022 to 08/12/2022.

Type of sample	: Ambient Noise	Sample Registration Date	: 25/12/2022
Sampling Date	: 07/12/2022 to 08/12/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 26/12/2022
Quantity received	: 24 Hourly Sample	Sampling Method	: ELPL/III/SOP/37
Sample's Location	: Ahallup		

Location ANQ-15

(Page 1 of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	59.2	13	18:00 to 19:00	64.7
2	07:00 to 08:00	63.7	14	19:00 to 20:00	61.2
3	08:00 to 09:00	66.5	15	20:00 to 21:00	58.5
4	09:00 to 10:00	68.2	16	21:00 to 22:00	56.4
5	10:00 to 11:00	66.1	17	22:00 to 23:00	55.6
6	11:00 to 12:00	63.5	18	23:00 to 00:00	51.4
7	12:00 to 13:00	60.6	19	00:00 to 01:00	48.3
8	13:00 to 14:00	64.6	20	01:00 to 02:00	44.5
9	14:00 to 15:00	64.3	21	02:00 to 03:00	40.4
10	15:00 to 16:00	62.5	22	03:00 to 04:00	43.6
11	16:00 to 17:00	65.3	23	04:00 to 05:00	48.5
12	17:00 to 18:00	65.8	24	05:00 to 06:00	54.5

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	72.7	43.2
L <sub>50</sub>	dB(A)	62.3	38.4
L <sub>90</sub>	dB(A)	50.4	33.2
Leq	dB(A)	63.2	48.4
Av. Leq	dB(A)	56.0	

Standards for Ambient Noise As per Noise Pollution (Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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CIN-U93000DL2014PTC267663



## TEST REPORT

Issued to

M/s Rodic Consultants Private Limited  
In JV with M/s K & J Projects Private Limited  
Ward No-11, Mamang Leikai Bishanpur Bazar,  
Ngaikhong Near Ngaikhong Parking  
Bishanpur, Manipur

Doc No. : ELPL/IV/QF/20  
Amend. No. & Amend. Date : 02 & 17.02.2018  
Lab Reference No. : 221225096 N  
Issue Date : 23/01/2023  
Your Reference : Email

**Project** – Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur.

**Sample Particulars:** Ambient Noise Monitoring was monitored at Advanced Hospital, Manipur from 15/11/2022 to 16/11/2022.

Type of sample	: Ambient Noise	Sample Registration Date	: 25/12/2022
Sampling Date	: 15/11/2022 to 16/11/2022	Analysis Starting Date	: 25/12/2022
Sampling Done by	: Lab representative	Analysis Completion Date	: 30/12/2022
Quantity received	: 24 Hourly Sample	Sampling Method	: ELPL/III/SOP/37
Sample's Location	: Advanced Hospital		

Location ANQ-16

(Page1of 1)

Noise Level Testing Results					
Sr. No	Time (Hrs)	dB(A) Leq	Sr. No	Time (Hrs)	dB(A) Leq
1	06:00 to 07:00	58.4	13	18:00 to 19:00	65.3
2	07:00 to 08:00	61.6	14	19:00 to 20:00	65.8
3	08:00 to 09:00	63.8	15	20:00 to 21:00	64.7
4	09:00 to 10:00	64.7	16	21:00 to 22:00	60.6
5	10:00 to 11:00	64.6	17	22:00 to 23:00	57.2
6	11:00 to 12:00	62.4	18	23:00 to 00:00	53.6
7	12:00 to 13:00	60.5	19	00:00 to 01:00	50.5
8	13:00 to 14:00	64.6	20	01:00 to 02:00	48.8
9	14:00 to 15:00	62.6	21	02:00 to 03:00	47.4
10	15:00 to 16:00	60.7	22	03:00 to 04:00	45.9
11	16:00 to 17:00	62.8	23	04:00 to 05:00	48.6
12	17:00 to 18:00	64.9	24	05:00 to 06:00	51.3

Testing Results			
Parameter	Unit	Day	Night
L <sub>10</sub>	dB(A)	72.1	48.1
L <sub>50</sub>	dB(A)	62.3	39.2
L <sub>90</sub>	dB(A)	50.4	35.6
Leq	dB(A)	63.0	50.4
Av. Leq	dB(A)	56.9	

Standards for Ambient Noise As per Noise Pollution ( Regulation & Control Rule-2000)			
Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

\*\*\*\*\*END OF REPORT\*\*\*\*\*

Checked By  
(VIKASH KUMAR)

Authorized Signatory  
(SNEH SMITA)

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Email : bd@ecostepslab.com | www.ecostepslab.com | Tel : +91 120 4333226

CIN-U93000DL2014PTC267663

# ***ANNEXURE - 9 - AIR MODELLING REPORTS***

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# *Air Modeling Report*

*For*

**Improvement of roads within Imphal city with rigid pavement including concrete lined drains, Externally Aided Projects (EAP) Public Works Department Government of Manipur, Imphal Manipur**

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**Submitted By :**

**ecosteps**  
**laboratory**

**Ecosteps Laboratory Pvt. Ltd.**

**Corporate Office & Laboratory D-79, Sector-6, Noida, U.P. 201301  
NABL Accreditation and MOEF&CC Approved Laboratory**

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## Methodology for Air Quality Modelling

CALINE 4 (Caltrans, 1989) is a simple line source Gaussian plume dispersion model that predicts air impacts near roadways. The model is broadly divided into five screens such as Job Parameters, Run Conditions, Link Geometry, Link Activity and Receptor Positions

### Job Parameters

**Run Type:** determine averaging times and how the hourly average wind angle(s) will be determined. In the present case modeling exercise were made to predict the impact on worst case scenario. Multi-Run / Worst Case Hybrid type was used for CO impact modeling.

**Aerodynamic Roughness Coefficient:** determine the amount of local air turbulence that affects plume spreading. CALINE 4 offers the 4 choices for aerodynamic roughness Coefficient namely; Rural, Suburban, Central Business District and Other. For the present modelling rural roughness options have been considered.

**Altitude above Sea Level:** Define the altitude above mean sea level. This input is used to determine the rate of plume spreading.

### Run conditions

**Wind Speed:** Expressed in meters per second. USEPA recommends a value of 1 m/s as the worst case wind speed.

**Wind Direction:** The direction the wind is blowing from, measured clockwise in degrees from the north. As the model study is on “Worst Case scenario”, therefore CALINE 4 will consider this input.

### Link Geometry

**Link Type:** 5 choices available such as At Grade, Fill, Depressed, Bridge and Parking lot. In this particular model study At Grade link type is used.

**Link Height:** For the project link height is being considered as zero.

**Mixing Zone Width:** Mixing zone is defined as the width of the roadway, plus 3m on either side.

## Link Activity

**Traffic Volume:** The hourly traffic volume anticipated to travel on each link, in units of vehicles per hour.

**Emission Factor:** The weighted average emission rate of the local vehicle fleet, expressed in terms of grams / mile per vehicle.

## Receptor Positions

Receptors positions expressed in Cartesian (x, y) coordinate system. Z value can also be provided to assess the proposed impacts at various heights. For the present case incremental GLCs were assessed. Approach and Methodology Emission Factors were arrived using standard values prescribed by The Automotive Research Association of India, Pune under Air Quality Monitoring Project-Indian Clean Air Programme (ICAP). Traffic load and emission factors were estimated for traffic sections. Table below presents the Traffic and emission factor considered for the project.

**Table 1: Traffic and emission factors for traffic sections at Advance Hospital**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	191	1.47E-01	1.89E+00	4.21E+00
2030	377	2.57E-01	3.62E+00	8.13E+00
2040	876	5.40E-01	8.31E+00	1.77E+01
2050	2169	1.26E+00	2.08E+01	3.80E+01
2060	6308	3.61E+00	6.23E+01	8.75E+01
2070	21815	1.25E+01	2.21E+02	2.34E+02

**Table 2: Traffic and emission factors for traffic sections at Ahallup**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	53	0.033146125	0.510076229	1.253779597
2030	103	0.059014197	0.968272621	2.412614818
2040	227	0.120858587	2.092091813	5.133586749
2050	476	0.245410927	4.384281692	10.29056863
2060	979	0.501399892	9.100386298	19.70379907
2070	2066	1.074395506	19.5869925	36.96870728



**Table 3: Traffic and emission factors for traffic sections at Central Agriculture University**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	21	0.015999382	0.239932854	0.492317813
2030	41	0.029799466	0.466275317	0.9542579
2040	99	0.066659097	1.087878887	2.091830598
2050	262	0.166416823	2.817517318	4.606086757
2060	839	0.509238996	8.888114884	11.17283216
2070	3156	1.863269963	33.12766387	32.25725998

**Table 4: Traffic and emission factors for traffic sections at Herbert School**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	47	0.027308889	0.453129396	1.056663389
2030	96	0.053166648	0.922668538	2.075419857
2040	249	0.134471259	2.411621762	4.718612775
2050	774	0.423284474	7.678959922	11.40691431
2060	2995	1.680802818	30.4731155	32.87237604
2070	12793	7.302377473	132.0542542	114.5738641

**Table 5: Traffic and emission factors for traffic sections at Kongba Bazar**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	186	0.158600465	1.960691396	4.196210417
2030	366	0.277998796	3.756788621	8.099462232
2040	855	0.583081842	8.617044282	17.62424265
2050	2156	1.362951736	21.70586911	38.1248518
2060	6472	3.896018477	65.85665039	89.04840206
2070	23067	13.55316823	237.5267199	244.1329355

**Table 6: Traffic and emission factors for traffic sections at Lamlong Higher Secondary School**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	276	0.249576118	2.861513625	5.710984014
2030	544	0.428204118	5.449439792	11.0164163

2040	1290	0.890709579	12.66855264	24.1697614
2050	3383	2.133666086	33.40324572	53.74453775
2060	10762	6.43751596	108.4026603	133.1197927
2070	40246	23.54704868	412.70636	394.2901781

**Table 7: Traffic and emission factors for traffic sections at Lawang Sangbam haotabi**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	53	0.033146125	0.510076229	1.253779597
2030	103	0.059014197	0.968272621	2.412614818
2040	227	0.120858587	2.092091813	5.133586749
2050	476	0.245410927	4.384281692	10.29056863
2060	979	0.501399892	9.100386298	19.70379907
2070	2066	1.074395506	19.5869925	36.96870728

**Table 8: Traffic and emission factors for traffic sections at Malom Bazar**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	47	0.027308889	0.453129396	1.056663389
2030	96	0.053166648	0.922668538	2.075419857
2040	249	0.134471259	2.411621762	4.718612775
2050	774	0.423284474	7.678959922	11.40691431
2060	2995	1.680802818	30.4731155	32.87237604
2070	12793	7.302377473	132.0542542	114.5738641

**Table 9: Traffic and emission factors for traffic sections at New Age Public School**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	80	0.033976354	0.65477666	1.941380306
2030	161	0.065053912	1.308789934	3.775511212
2040	382	0.156093409	3.186975794	8.269180472
2050	996	0.441033161	8.782111419	18.06599387
2060	3134	1.556435084	29.69859556	43.08632083
2070	11642	6.280371261	116.1911582	121.7524089

**Table 10: Traffic and emission factors for traffic sections at Prism Academy**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	294	0.235009833	3.304333424	7.556844396
2030	582	0.419048372	6.396692977	14.62219228
2040	1322	0.881244066	14.45284418	31.58487787
2050	3011	1.954183286	33.55953653	65.83293089
2060	7391	4.900561564	86.46596176	139.1899232
2070	20940	14.59898977	260.9592732	322.2224544

**Table 11: Traffic and emission factors for traffic sections at RIMS**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	383	0.448056295	4.049198821	7.573569117
2030	723	0.720303091	7.28397716	14.34475877
2040	1612	1.357821773	15.7063077	30.69129441
2050	3865	2.829548232	37.482288	65.29938585
2060	10951	7.177964381	108.3345444	149.0119929
2070	37265	22.80608944	377.8248518	396.727484

**Table 12: Traffic and emission factors for traffic sections at Royal Academy Of Science**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	209	0.176457042	2.152576688	4.395755285
2030	415	0.308686791	4.14833655	8.505774153
2040	975	0.647661723	9.580646245	18.59043391
2050	2445	1.510771644	24.13688388	40.42373785
2060	7214	4.278525874	72.48877148	94.85788478
2070	25211	14.70210583	257.9252054	260.6813385

**Table 13: Traffic and emission factors for traffic sections at Shishu Nistha Niketan**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	71	0.038034639	0.643413417	1.629202146
2030	145	0.072728766	1.296782508	3.184076914
2040	359	0.176668471	3.260703217	7.099233105

2050	1015	0.517998226	9.608997518	16.27067969
2060	3548	1.915250627	35.16070083	42.64956628
2070	14221	7.977010948	145.0614804	135.0841926

**Table 14: Traffic and emission factors for traffic sections at St Anthonys High School**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	53	0.033146125	0.510076229	1.253779597
2030	103	0.059014197	0.968272621	2.412614818
2040	227	0.120858587	2.092091813	5.133586749
2050	476	0.245410927	4.384281692	10.29056863
2060	979	0.501399892	9.100386298	19.70379907
2070	2066	1.074395506	19.5869925	36.96870728

**Table 15: Traffic and emission factors for traffic sections at St Joseph School**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	71	0.038034639	0.643413417	1.629202146
2030	145	0.072728766	1.296782508	3.184076914
2040	359	0.176668471	3.260703217	7.099233105
2050	1015	0.517998226	9.608997518	16.27067969
2060	3548	1.915250627	35.16070083	42.64956628
2070	14221	7.977010948	145.0614804	135.0841926

**Table 16: Traffic and emission factors for traffic sections at New Light Public School**

Year	Traffic Volume per day	Emission for PM	Emission for NO2	Emission for CO
2022	80	0.033976354	0.65477666	1.941380306
2030	161	0.065053912	1.308789934	3.775511212
2040	382	0.156093409	3.186975794	8.269180472
2050	996	0.441033161	8.782111419	18.06599387
2060	3134	1.556435084	29.69859556	43.08632083
2070	11642	6.280371261	116.1911582	121.7524089

## Results

Dispersion model software was run by using data as discussed above. The output results at various distances along the project highway for projected year 2069-70 are presented in Table and Figure below.

### 1. Advanced Hospital

#### a. PM



Figure 1: Isopleth for PM for the projected year 2069-70

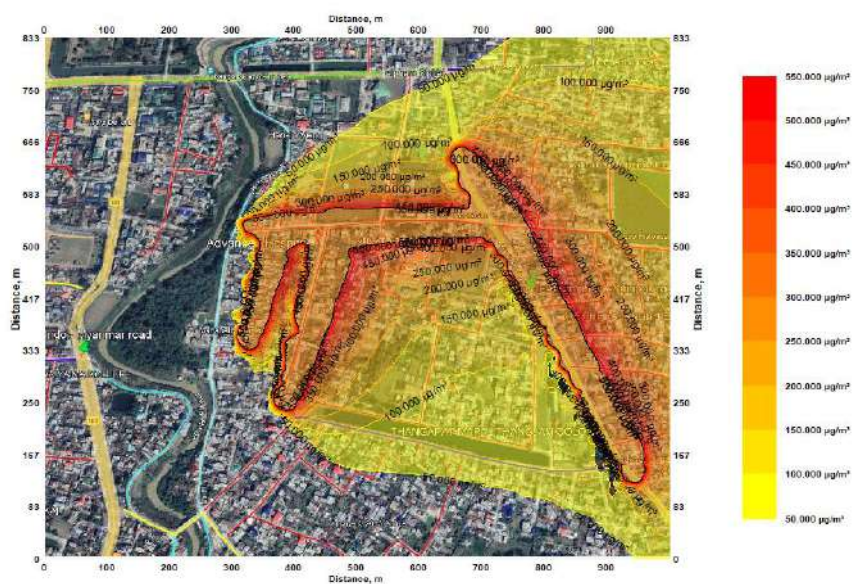
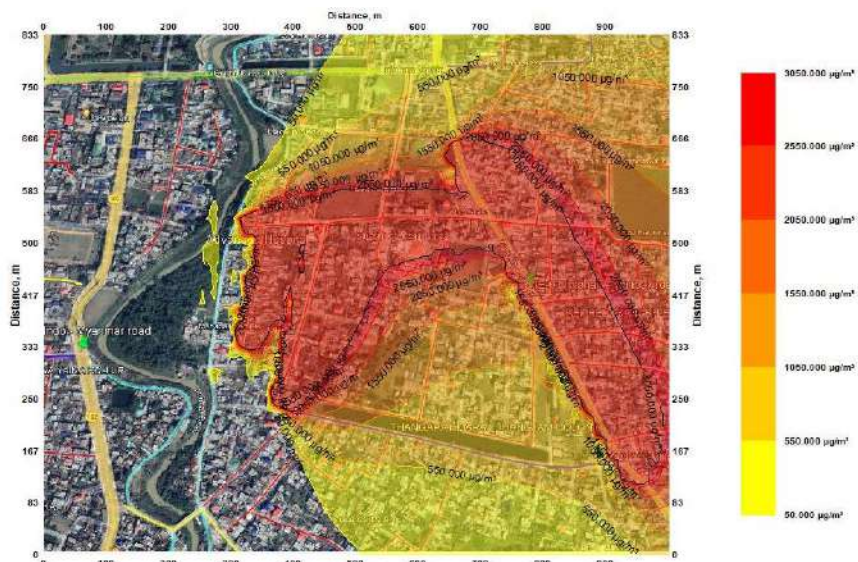


Figure 2: Isopleth for NO2 for the projected year 2069-70



**Figure 3: Isopleth for CO for the projected year 2069-70**

Table 17: Baseline Incremental Value in 2069-70 near Advanced Hospital

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	232.800	411.600	4.357

2. Ahallup



**Figure 4: Isopleth for PM for the projected year 2069-70**



**Figure 5: Isopleth for NO<sub>2</sub> for the projected year 2069-70**

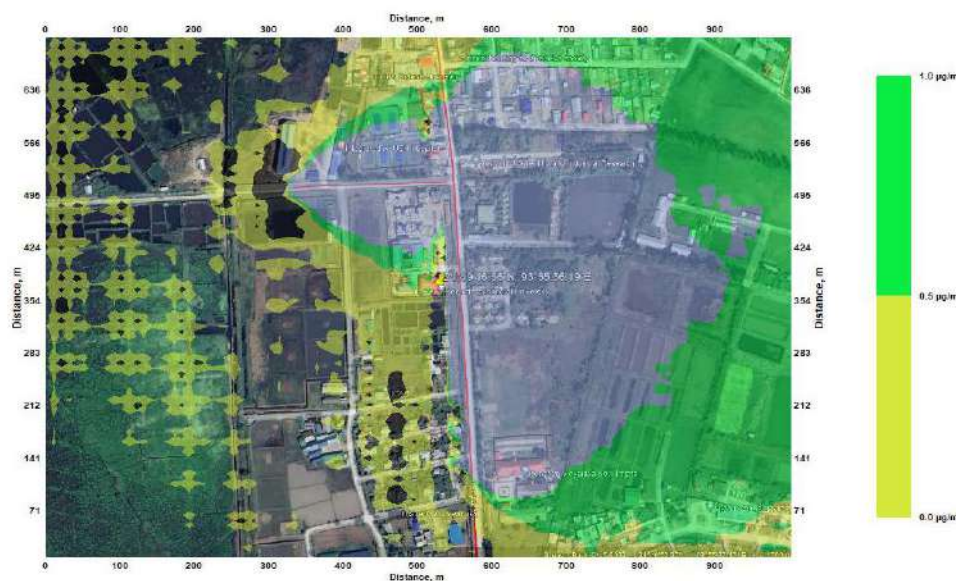


**Figure 6: Isopleth for CO for the projected year 2069-70**

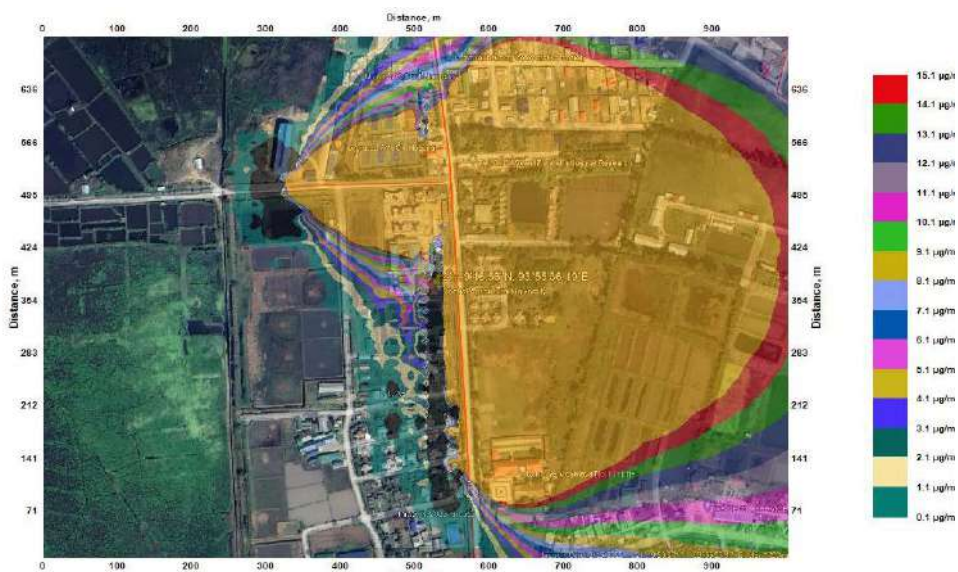
Table 18: Baseline Incremental Value in 2069-70 near Ahallup

Year	Incremental in PM in (ug/m <sup>3</sup> )	Incremental in NO <sub>2</sub> (ug/m <sup>3</sup> )	Incremental in CO (mg/m <sup>3</sup> )
2070	0.500	9.100	0.0039

### 3. Central Agriculture University



**Figure 7: Isopleth for PM for the projected year 2069-70**



**Figure 8: Isopleth for NO<sub>2</sub> for the projected year 2069-70**



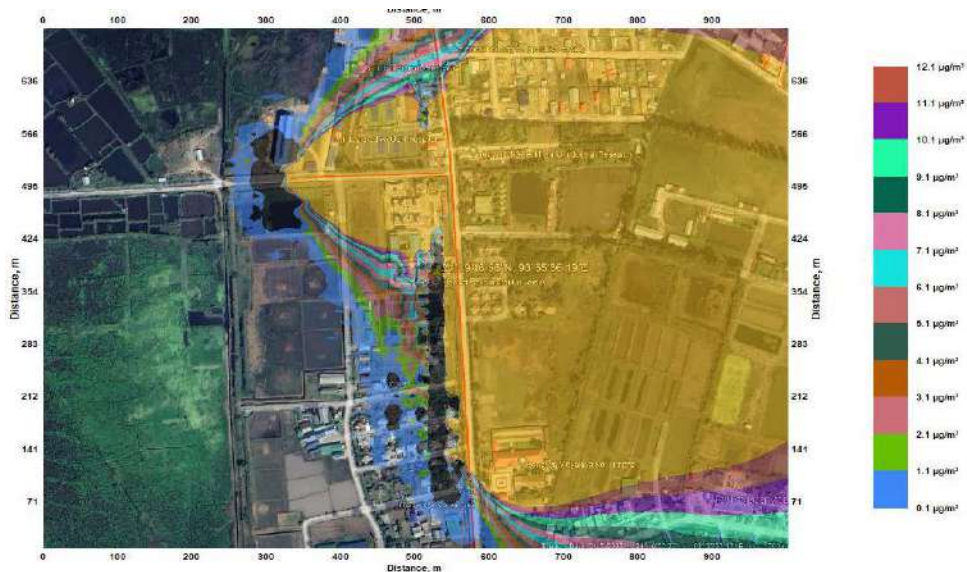


Figure 9: Isopleth for CO for the projected year 2069-70

Table 19: Baseline Incremental Value in 2069-70 near Central Agriculture University

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	0.600	10.800	0.010

#### 4. Herbert School

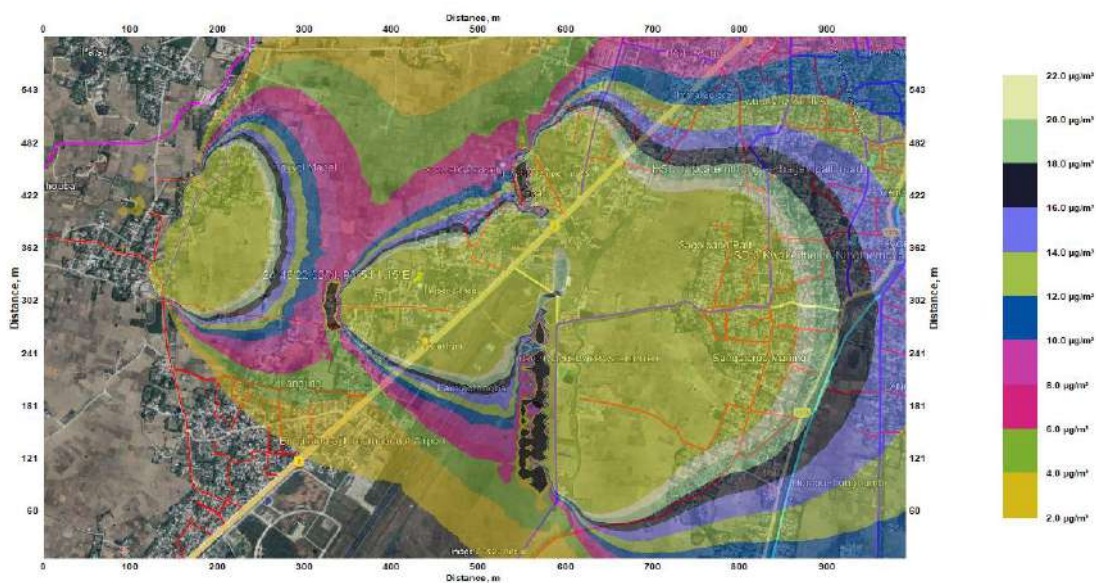
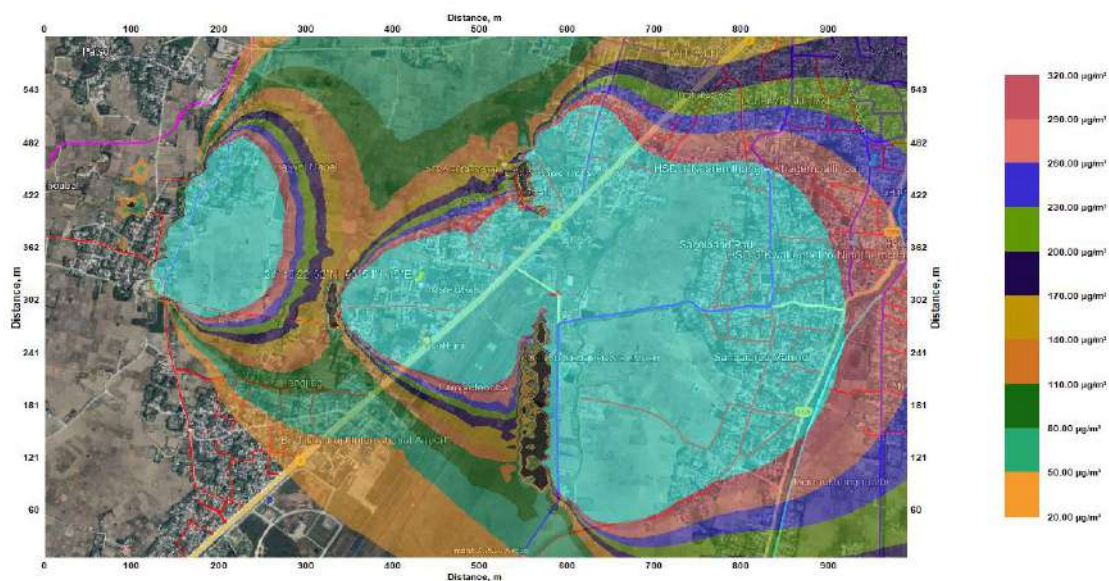
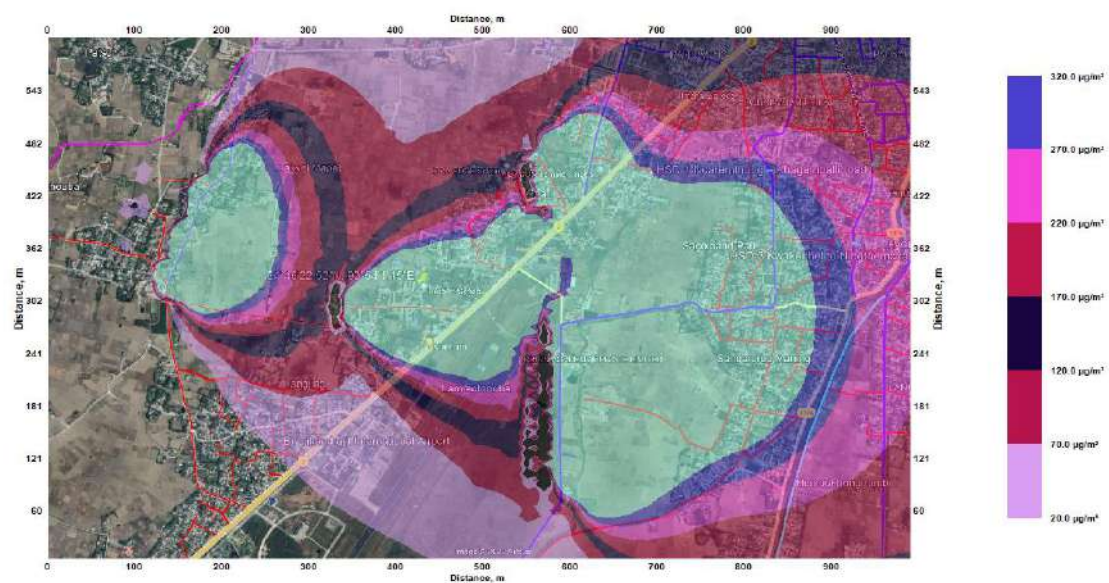


Figure 10: Isopleth for PM for the projected year 2069-70



**Figure 11: Isopleth for NO2 for the projected year 2069-70**

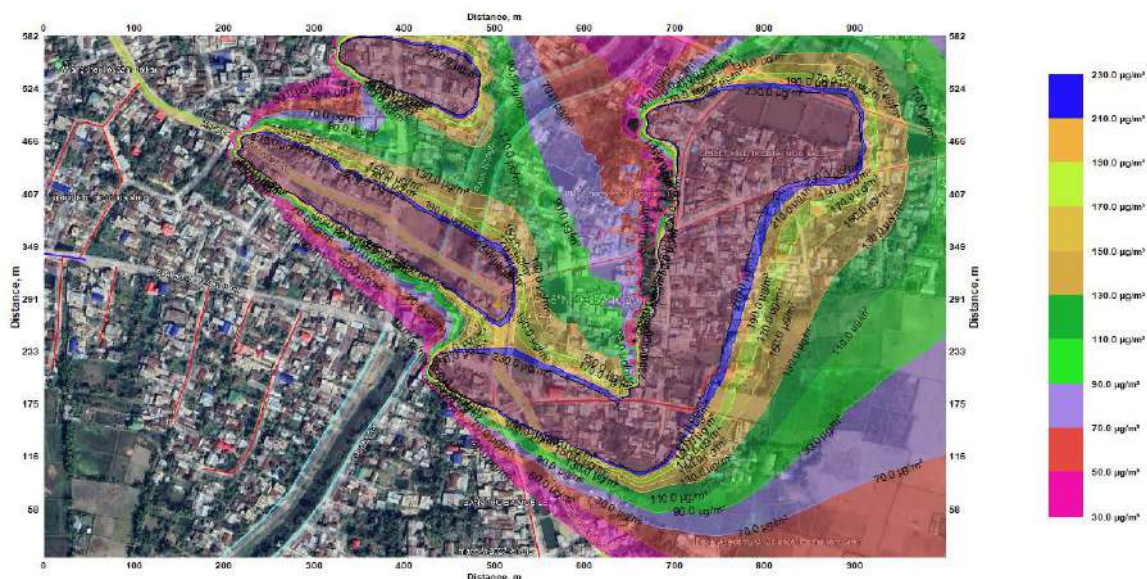


**Figure 12: Isopleth for CO for the projected year 2069-70**

**Table 20: Baseline Incremental Value in 2069-70 near Herbert School**

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	15.60	282	0.24

### 5. Kongba Bazar



**Figure 13: Isopleth for PM for the projected year 2069-70**



**Figure 14: Isopleth for NO2 for the projected year 2069-70**



Figure 15: Isopleth for CO for the projected year 2069-70

Table 21: Baseline Incremental Value in 2069-70 near Konga Bazar

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	201	160	3.45

### 6. Lamlong Higher Secondary School



Figure 16: Isopleth for PM for the projected year 2069-70



Figure 17: Isopleth for NO2 for the projected year 2069-70

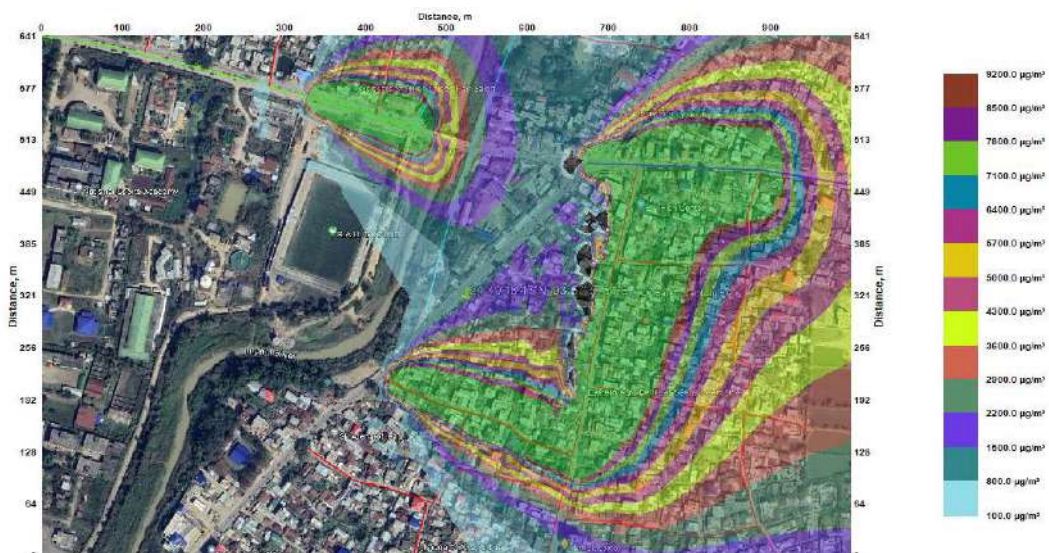


Figure 18: Isopleth for CO for the projected year 2069-70

Table 22: Baseline Incremental Value in 2069-70 near Konga Bazar

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	530	927	8.87

### 7. Lawang Sangbam haotabi

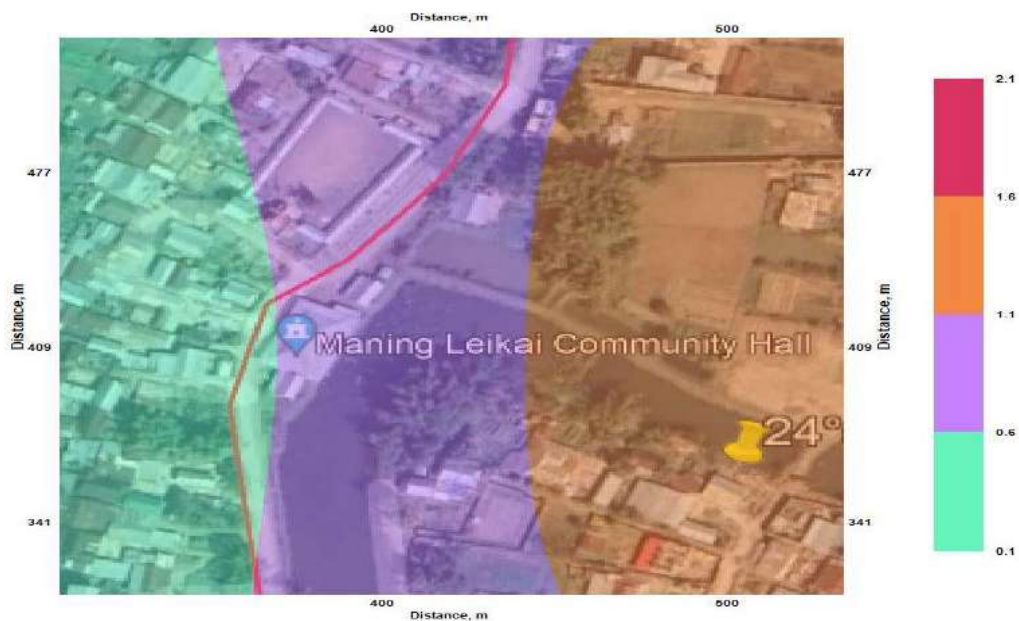


Figure 19: Isopleth for PM for the projected year 2069-70



Figure 20: Isopleth for NO2 for the projected year 2069-70



Figure 21: Isopleth for CO for the projected year 2069-70

Table 23: Baseline Incremental Value in 2069-70 near Lawang Sangbam haotabi

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	1.3	25.300	0.047

### 8. Malom Bazar



Figure 22: Isopleth for PM for the projected year 2069-70



**Figure 23: Isopleth for NO2 for the projected year 2069-70**



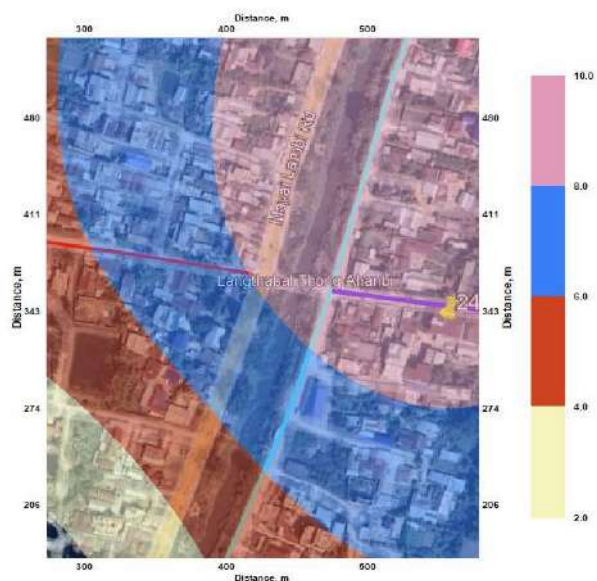
**Figure 24: Isopleth for CO for the projected year 2069-70**

**Table 24: Baseline Incremental Value in 2069-70 near Malom Bazar**

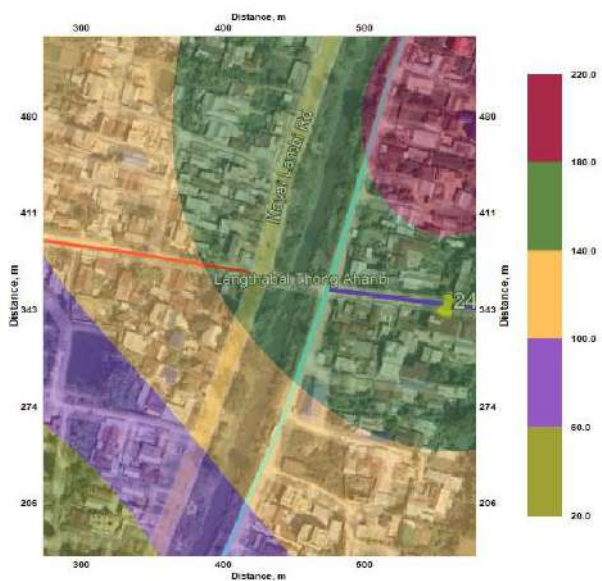
<b>Year</b>	<b>Incremental in PM in (ug/m<sup>3</sup>)</b>	<b>Incremental in NO2 (ug/m<sup>3</sup>)</b>	<b>Incremental in CO (mg/m<sup>3</sup>)</b>
2070	44.800	233.600	0.69



### 9. New Age Public School



**Figure 25: Isopleth for PM for the projected year 2069-70**



**Figure 26: Isopleth for NO2 for the projected year 2069-70**

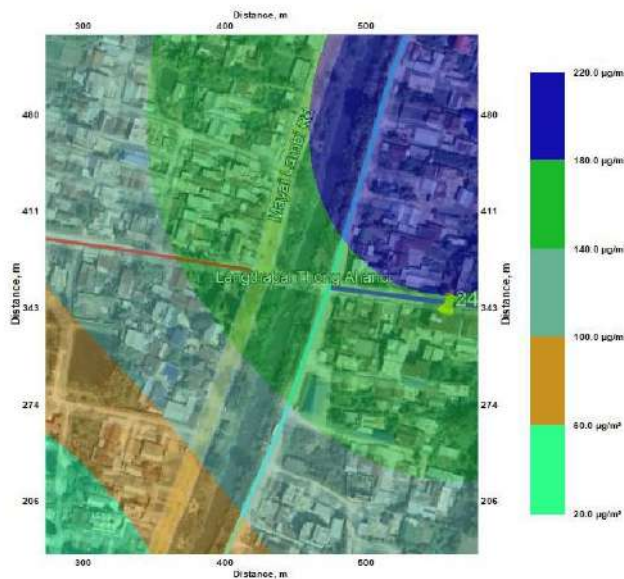


Figure 27: Isopleth for CO for the projected year 2069-70

Table 25: Baseline Incremental Value in 2069-70 near New Age Public School

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	10	186.600	0.196

10. New Light Public School



Figure 28: Isopleth for PM for the projected year 2069-70

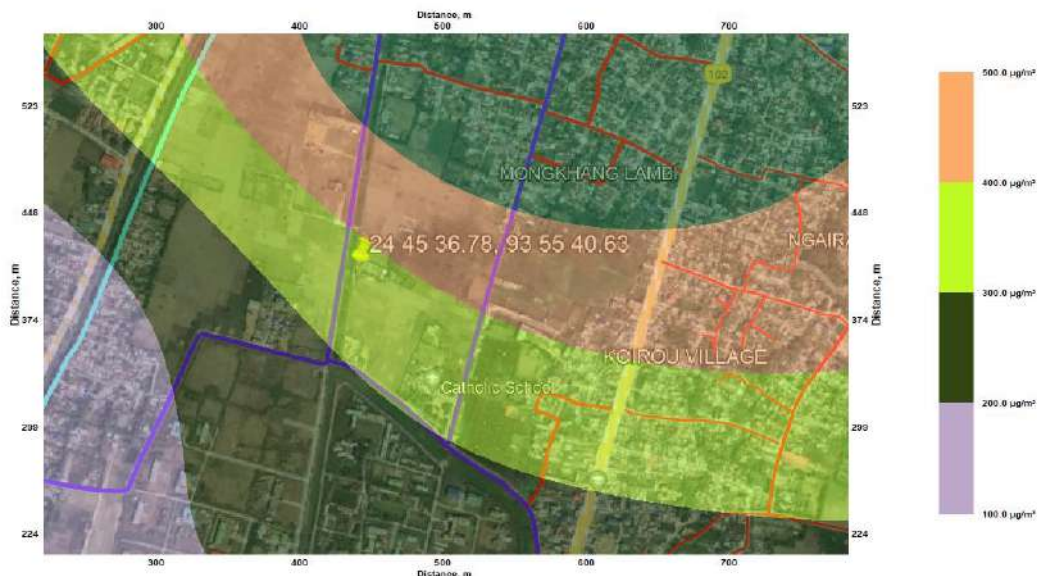


Figure 29: Isopleth for NO2 for the projected year 2069-70



Figure 30: Isopleth for CO for the projected year 2069-70

Table 26: Baseline Incremental Value in 2069-70 near New Light Public School

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	33.400	623.200	0.65

### 11. Prism Academy



**Figure 31: Isopleth for PM for the projected year 2069-70**



**Figure 32: Isopleth for NO2 for the projected year 2069-70**



Figure 33: Isopleth for CO for the projected year 2069-70

Table 27: Baseline Incremental Value in 2069-70 near Prism Academy

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	188.500	1117.300	4.3

12. RIMS

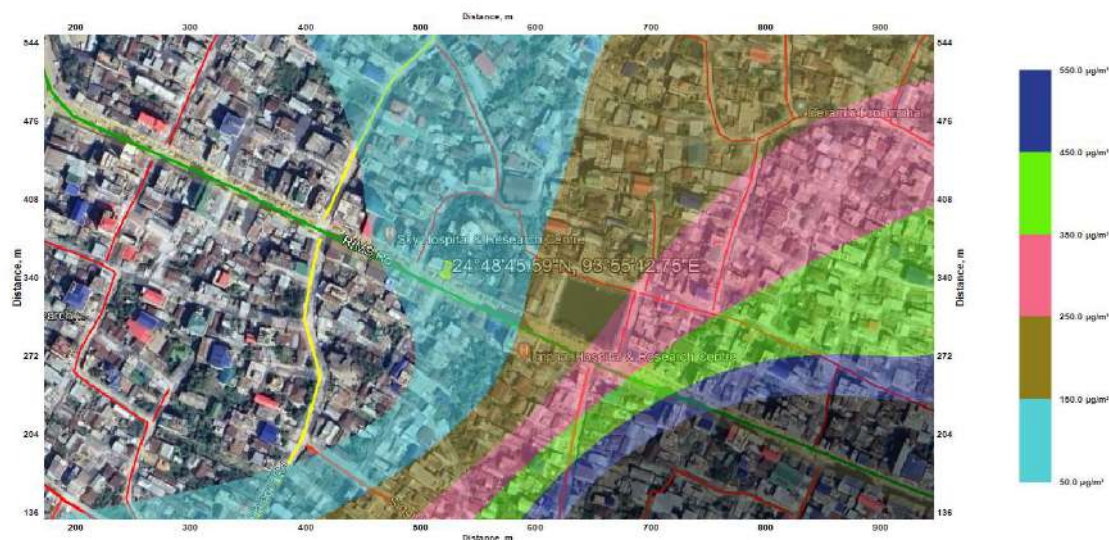


Figure 34: Isopleth for PM for the projected year 2069-70



**Figure 35: Isopleth for NO<sub>2</sub> for the projected year 2069-70**

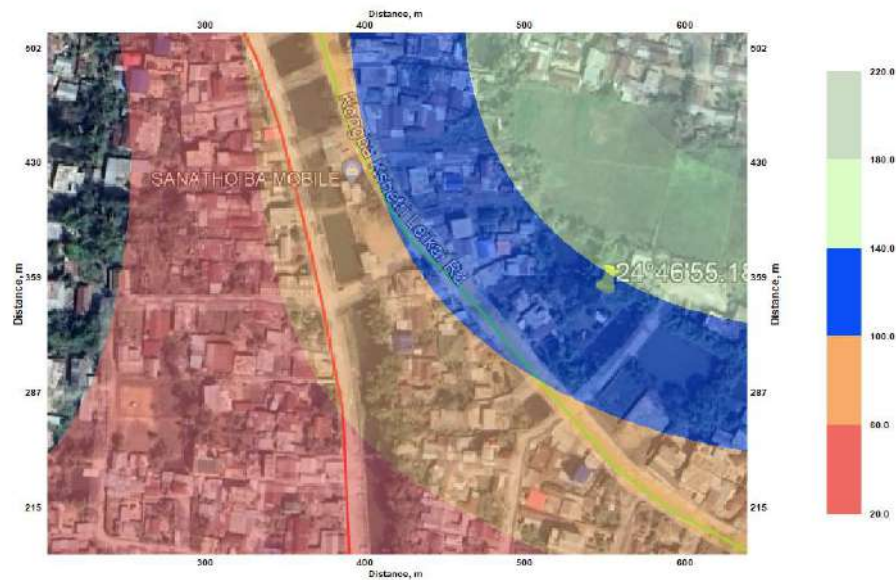


**Figure 36: Isopleth for CO for the projected year 2069-70**

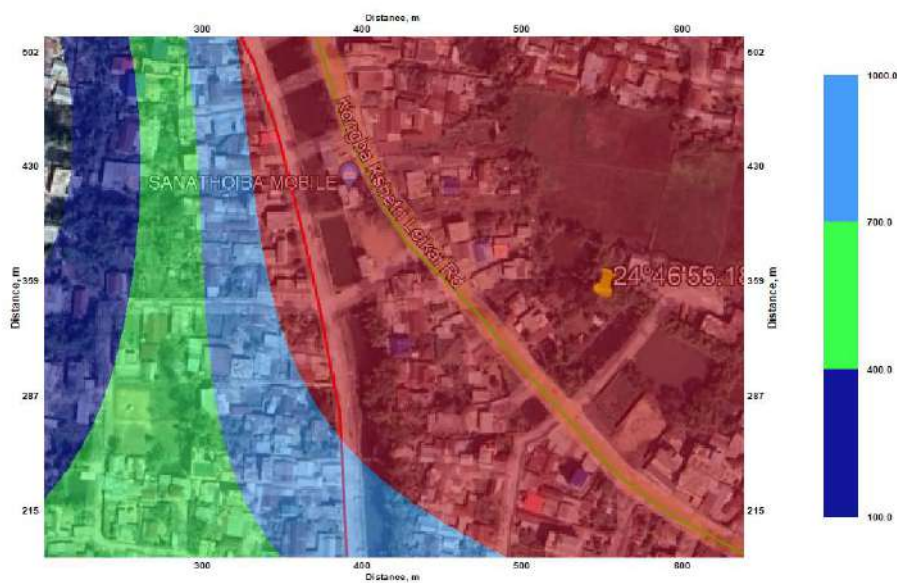
**Table 28: Baseline Incremental Value in 2069-70 near RIMS**

<b>Year</b>	<b>Incremental in PM in (ug/m<sup>3</sup>)</b>	<b>Incremental in NO<sub>2</sub> (ug/m<sup>3</sup>)</b>	<b>Incremental in CO (mg/m<sup>3</sup>)</b>
2070	537	2388	2.51

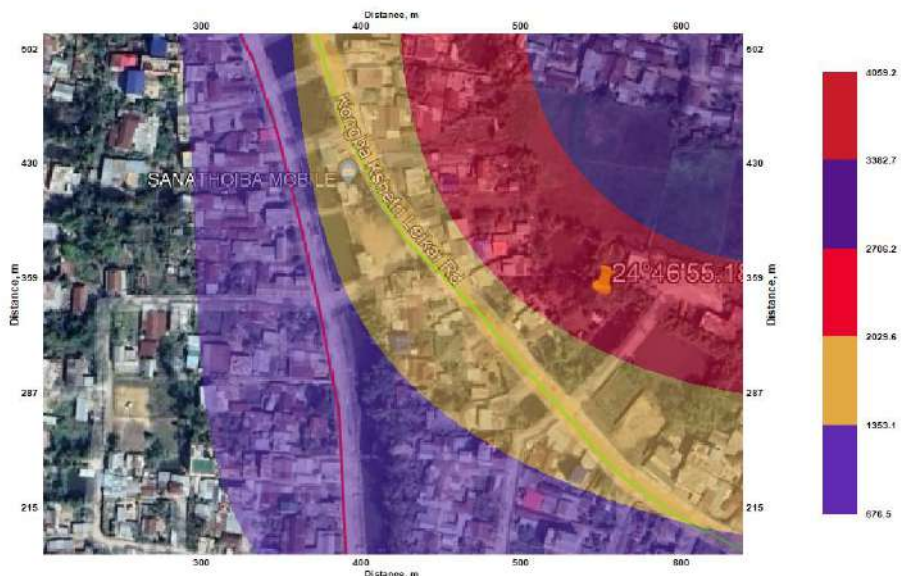
### 13. Royal Academy of Science



**Figure 37: Isopleth for PM for the projected year 2069-70**



**Figure 38: Isopleth for NO2 for the projected year 2069-70**



**Figure 39: Isopleth for CO for the projected year 2069-70**

Table 29: Baseline Incremental Value in 2069-70 near Royal Academy of Science

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	199.600	1023	3.38

**14. Shishu Nistha Niketan**



**Figure 40: Isopleth for PM for the projected year 2069-70**





**Figure 41: Isopleth for NO<sub>2</sub> for the projected year 2069-70**

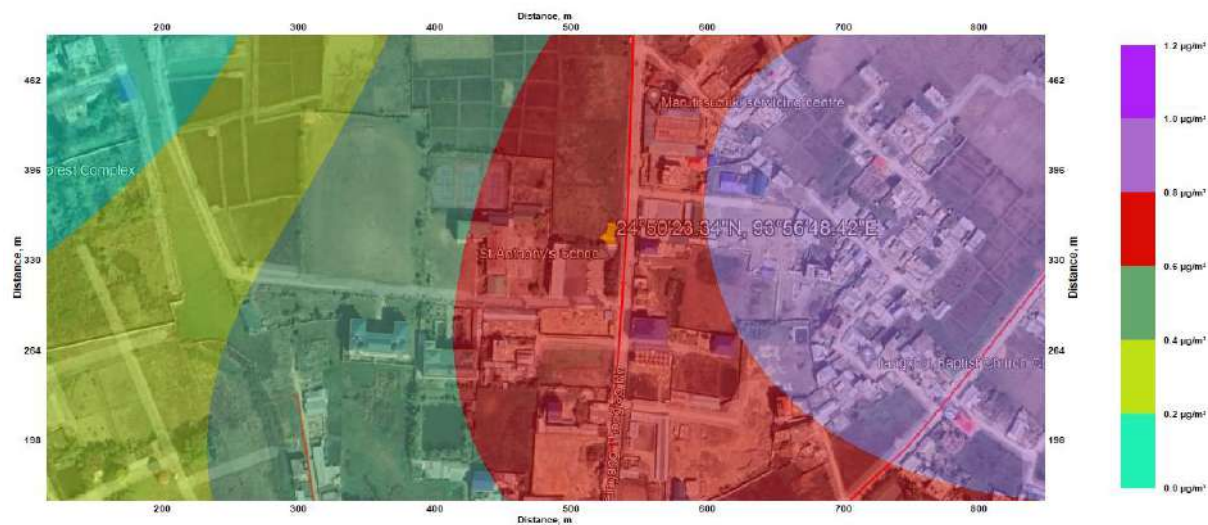


**Figure 42: Isopleth for CO for the projected year 2069-70**

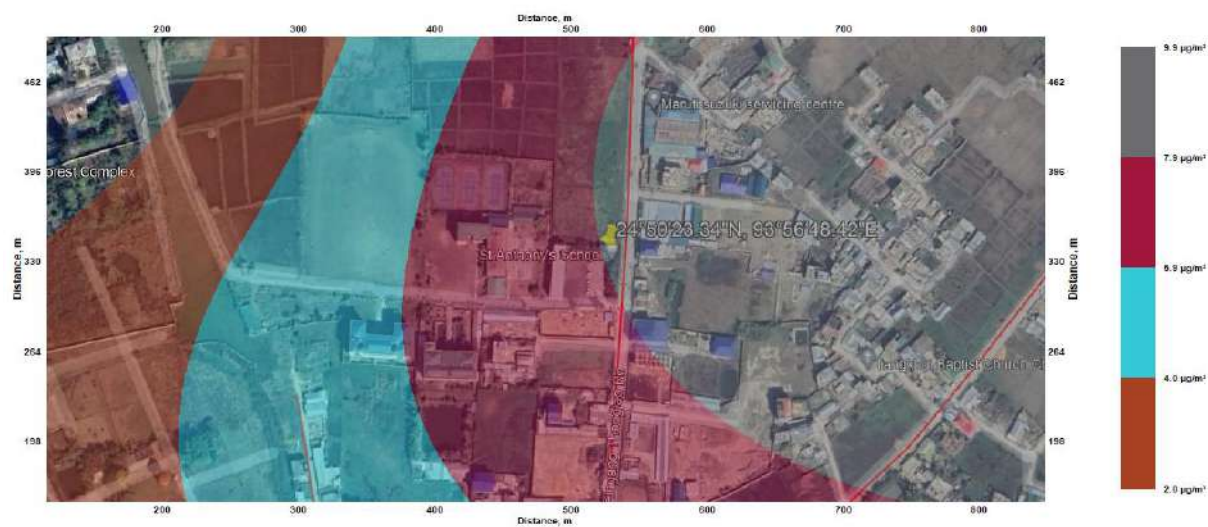
**Table 30: Baseline Incremental Value in 2069-70 near Shishu Nistha Niketan**

Year	Incremental in PM in (ug/m <sup>3</sup> )	Incremental in NO <sub>2</sub> (ug/m <sup>3</sup> )	Incremental in CO (mg/m <sup>3</sup> )
2070	117.900	1302	1.9

## 15. St Anthony's High School



**Figure 43: Isopleth for PM for the projected year 2069-70**



**Figure 44: Isopleth for NO2 for the projected year 2069-70**

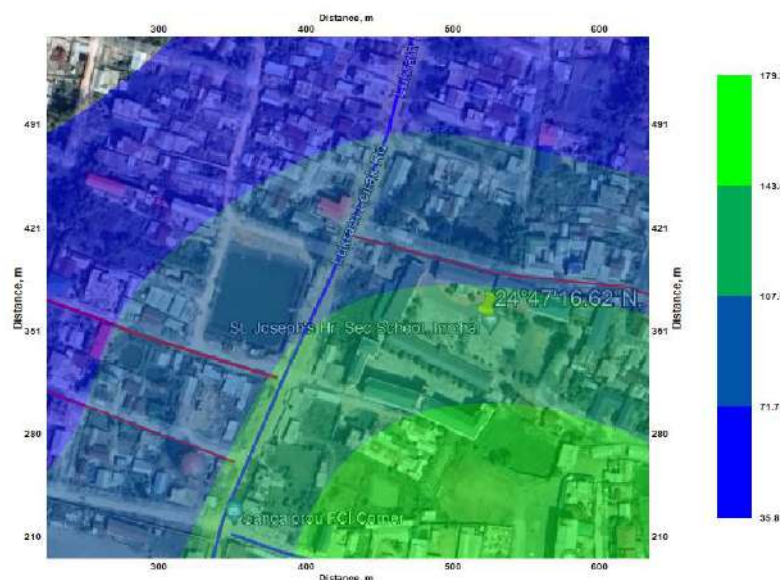


**Figure 45: Isopleth for CO for the projected year 2069-70**

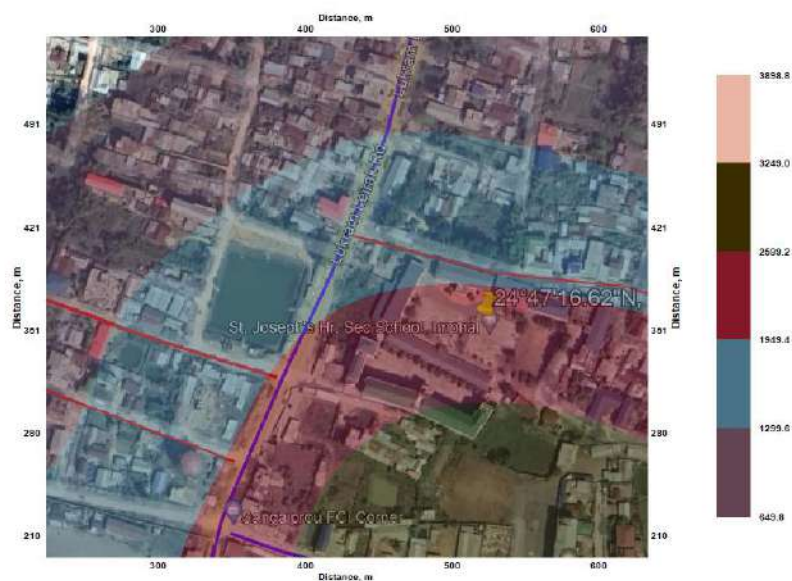
**Table 31: Baseline Incremental Value in 2069-70 near St Anthony's High School**

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	0.800	9.100	0.03

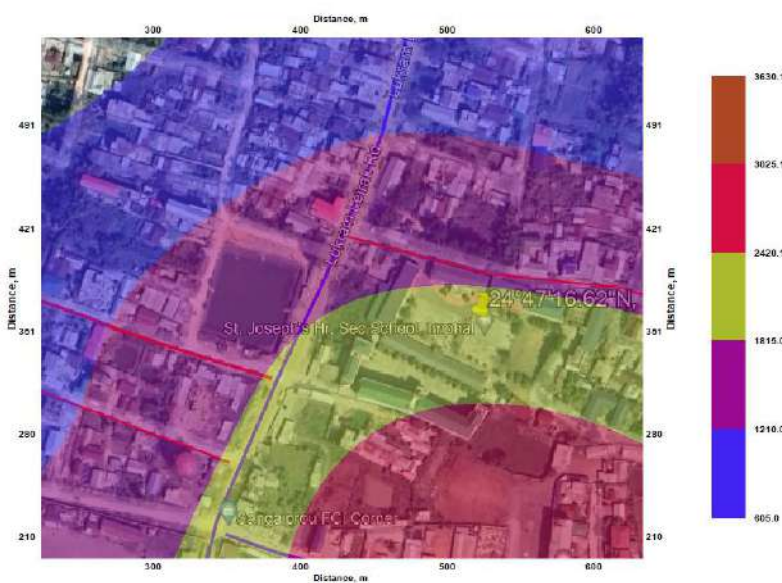
**16. St Joseph School**



**Figure 46: Isopleth for PM for the projected year 2069-70**



**Figure 47: Isopleth for NO2 for the projected year 2069-70**



**Figure 48: Isopleth for CO for the projected year 2069-70**

**Table 32: Baseline Incremental Value in 2069-70 near St Joseph School**

Year	Incremental in PM in (ug/m3)	Incremental in NO2 (ug/m3)	Incremental in CO (mg/m3)
2070	178.100	3228	3.05

**Conclusion**

Considering the maximum baseline ambient concentration of PM, NO<sub>x</sub> and CO i.e. 208 **ug/m<sup>3</sup>**, 15.01 **ug/m<sup>3</sup>**, 1.01 **mg/m<sup>3</sup>** and predicted incremental concentration is more than the Ambient Air Quality Standards.

***ANNEXURE - 10 - GUIDELINES  
FOR WATER CONSERVATION***

## ANNEXURE 10

### GUIDELINES FOR WATER CONSERVATION

#### Action Plan during construction phase for conservation of water

There are a number of dos and don'ts for the contractor as provided below

- Contractor's vehicles shall not be allowed to wash in the river or stream. This is to avoid potential pollution from oil residues.
- Contractors shall not use water from the community drinking water sources such as;
  - Public water supply schemes
  - Community spring water sources
  - Community hand pumps
  - Community bore wells / shallow tube wells
  - Location of the streams from which the Community takes drinking water
- Contractor shall obtain all legal approvals and clearances from the concerned departments.
- Contractor shall consult the local communities where the water source has been identified.
- If the source is a spring – check discharge, dependency in consultation with local communities.
- If the source is river/stream- discharge data for the past several years need to be analyzed, whether source is perennial, or non-perennial, any irrigation scheme is running over it or not, if IPH department is using it, or local people are using it or not. NOC from all concerned authorities will be required.
- If the source is Major River - In addition to the local permission, Contractor may require obtaining written permission from State level authorities.
- If the sources are groundwater (a hand pump/bore well or open deep well) then its chemical composition and water related tests are required to be obtained from the competent authority and an NOC is obtained from the competent authority.
- Rain water harvesting shall be carried out where ever feasible.
- STP treated water shall be procured from nearby STPs and shall be used preferably for sprinkling and landscaping.
- Minimizing water requirement by using water conservation measures such as covering the water tanks, providing visual notice for water conservation, low flow taps in toilets etc.
- Regular inspection to detect leakage in water pipelines and water tanks.

#### Action Plan during Post Construction Stage

Once the Contractor finishes his job, this can be handed over to the local panchayath or for local communities. The possible alternate uses of this structure would be

- Local communities of this area can use the same source to meet their water needs
- If alignment passes through a plain water scarcity prone area and if no nearby water source has been identified, transportation is uneconomic, then contractor should go for Underground water option. If it is feasible and will not lead to a serious depletion of the ground water.

#### Action Plan during operation phase for conservation of water

- Minimize water requirement by using water conservation measures such as providing visual notice for water conservation, low flow taps and dual flushing system in toilets etc.
- Prevent leakage of water from water pipeline and water tanks.
- Provision of STP preferably if sewage is more than 10 KLD.
- Using the STP treated water for flushing and landscaping.

***ANNEXURE - 11 - CULTURAL  
HERITAGE MONUMENT  
CONSERVATION PLAN***



## ANNEXURE 11

### CULTURAL HERITAGE MONUMENT CONSERVATION PLAN

#### **The Ancient Monuments and Archaeological Sites and Remains Act, 1958 and The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010**

The Ancient Monuments and Archaeological Sites and Remains Rules define the power of central government as follows "Categorisation and classification in respect of ancient monuments or archaeological sites and remains declared as of national importance under sections 3 and 4--(1) The Central Government shall, on the recommendation of the Authority, prescribe categories in respect of ancient monuments or archaeological sites and remains declared as of national importance under sections 3 and 4, and while prescribing such categories it shall have regard to the historical, archaeological and architectural value and such other factors as may be relevant for the purpose of such categorisation."

"The Central Government shall, on the recommendation of the Authority, classify all the ancient monuments or archaeological sites and remains declared as of national importance under sections 3 and 4, in accordance with the categories prescribed under sub-section (1) and thereafter make the same available to the public and exhibit the same on its website and also in such other manner as it may deem fit."

This Act provides for the preservation of ancient and historical monuments and archaeological sites and remains of national importance and for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects. According to this Act, areas within the radii of 100m from the "Protected Monument" are designated as "Prohibited Areas" and from and from 200m are designated as "Controlled / Regulated Areas".

No development activity (including building, mining, excavating, blasting) is permitted in the "prohibited areas". Development activities likely to damage the protected monument are not permitted in the "controlled/regulated areas" without prior permission from the Archaeological Survey of India (ASI) if the site/remains/ monuments are protected by ASI or the State Directorate of Archaeology. Kangla port lies within the project area and is a State Protected Monument. Thus the Act may be applicable on the project and it would be required to consult with Competent Authority, ASI for requirement of obtaining permission

#### **Guidelines for the chance findings of Cultural, Heritage and Archaeological Monument**

This act may also be applicable due to any chance finding of artefact during the construction. In such a case following guidelines are to be followed;

- All the staff and labours must be aware by the contractor and PMU regarding the importance of Cultural, Heritage and Archaeological Monuments.
- The person or group of persons who first time find or see such an entity must inform the senior staff on the site.
- The senior staff must stop the work immediately and protect the site/structure/entity by barricading etc.
- The senior staff must inform immediately to the nearest office of the ASI for investigating the further.
- The ASI officials will examine and determine the importance of such a finding and will take the further necessary action accordingly.

***ANNEXURE - 12 - EMERGENCY RESPONSE  
PLAN FOR DISASTER MANAGEMENT***

**DISASTER PLAN AND RISK ASSESSMENT MANAGEMENT****1.0 INTRODUCTION**

Disaster is a natural catastrophe that causes great damage or loss of life. A disaster is an unforeseen event, which can overwhelm the capacity of the affected people to manage its impact. Many people are periodically exposed to natural disasters in their life, and most disasters, or more correctly hazards that lead to disasters, cannot be prevented. However, their effects can be mitigated. Disaster management efforts aim to reduce or avoid the potential losses from hazards, assure prompt and appropriate assistance to the victims of a disaster, and achieve a rapid and effective recovery.

The Government of India vide gazette notification dated 26 December 2005 defined “Disaster” as a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or manmade causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to and destruction of property or damage to degradation of environment and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.

Disaster risk is defined as potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity. The definition of disaster risk reflects the concept of hazardous events and disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socioeconomic development, disaster risks can be assessed and mapped, in broad terms at least.

Risks and disaster factors are most important to consider in the social and environmental contexts. Acceptable risk, or tolerable risk, is therefore an important sub-term; the extent to which a disaster risk is deemed acceptable or tolerable depends on existing social, economic, political, cultural, technical and environmental conditions. In engineering terms, acceptable risk is also used to assess and define the structural and non-structural measures that are needed in order to reduce possible harm to people, property, services and systems to a chosen tolerated level, according to codes or “accepted practice” which are based on known probabilities of hazards and other factors. Residual risk is the disaster risk that remains even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained. The presence of residual risk implies a continuing need to develop and support effective capacities for emergency services, preparedness, response and recovery, together with socioeconomic policies such as safety nets and risk transfer mechanisms, as part of a holistic approach.

The successful management of a disaster depends on the ability to foresee and control it in time. Planning is thus vital for minimizing disaster effects, quick recovery, and resumption of work. The key to developing an effective disaster plan is to anticipate every possible vulnerability and taking the appropriate action to tackle the same effectively. In this context it is necessary to identify the available resources and utilize them most efficiently. The duties of various officials should be defined in detail so that work can proceed as per the planned strategy. The management should be fully prepared to face a disaster and should possess a proper action plan for dealing with the same. Disaster management plan also contains detailed guidelines relating to cases of breach/floods, earthquakes, cyclones, manmade disasters like terrorism etc. It must include management of rescue and relief operations including care for dead, communication network, restoration operations, maintenance of rescue vehicles & their equipment, media management, check list for officers and supervisors etc. In order to achieve this milestone a detailed disaster management plan and preparedness of disaster management are the pillars. • Disaster management manual- A detailed manual shall be prepared to cater the disasters occurring. It shall cover the following topics in detail

Proposed project involves improvement/rehabilitation of the road network in Greater Imphal Region. Project has a large spatial extent and the areas intercepted are prone to different kind of natural disasters. Further the project also involves several activities like: construction, demolition, handling of heavy machinery, handling of cables & electrical appliances, working at height, transportation of material, excavation, work on/near water bodies, etc. All these activities have several risks involved which have potential to cause an accident. These risks can broadly be termed as occupational risks and may cause several accidents and man-made disasters like fire, electrocution, fall from height etc. These disasters can be so severe and may lead to loss of both life and property. Thus, the project requires development of a concrete risk assessment and disaster management plan so as the risks can be minimized and disasters can be prevented. Also, the plan shall include the measures to be taken to handle the situation in case of occurrence of the disaster to minimize the loss and restore to the original condition.

**1.1 OBJECTIVES OF RISK AND DISASTER MANAGEMENT PLAN**

Risk and Disaster management plan plays an important role in the prompt management of disaster events, also ensuring that normally returns to the area within the shortest possible time.

Risk Management can help to prevent accidents from happening at particular locations for risk factors and provide advice for the necessary actions to prevent the massive destruction of lives and properties.

Disaster management plan is important in the sense that the trained personnel can carry out timely rescue missions as soon as there is a disaster in order to limit the number of lives lost and degree of injuries sustained. The team also help to provide relief measures to the disaster victims such as shelter, food, clothes and medicines as these helps to relief the suffering of the victims. The objective of Disaster Management Plan is to:

- Establish the coordinating mechanisms necessary to prepare and implement measures to safeguard the property and lives of all concerned during the threat of a disaster.
- Increase awareness to management and others of the need for disaster preparedness.

## 1.2 LEGAL FRAMEWORK FOR DISASTER MANAGEMENT IN INDIA

The Disaster Management Act, 2005 (hereinafter referred to as the Act), enacted by the Parliament was notified in the Gazette of India on 26th December, 2005. The Act provides the legal and institutional framework for the effective management of disasters. The Act mandates creation of new institutions and assignment of specific roles for Central, State and Local Governments. It is the central legislation on Disaster Management around which all the Disaster Management related activities revolve since its enactment. It legislates a holistic approach to Disaster Management; from mere responding to disasters to greater attention to prevention and mitigation, capacity building and preparedness.

Based on the definition of the 'Disaster' in the Disaster Management Act 2005, different types of disasters are as follows:

- **Natural Disaster**- Earthquake, Floods, Landslides; (addressed in the previous section on Risk Assessment, along with risks during construction)
- **Road Accidents**
- **Man-made Disaster** - Act of Terrorism and Sabotage

Under the provisions of the said Act, the National Disaster Management Authority (NDMA) has been established to prevent and handle the disasters occurring in the country and a National Executive Committee (NEC) of Secretaries has been created to assist the NDMA in the performance of its functions. At the State level, a State Disaster Management Authority has been created which has been assisted by a State Executive Committee. At the District level, District Disaster Management Authorities have been created. As per the act, NDMA is responsible for framing the policies and guidelines on disaster management for management of the disasters.

### ***National Policy on Disaster Management***

Under the provisions of the Act, the National Disaster Management Authority (NDMA) has been established under the chairmanship of the Hon. Prime Minister and a National Executive Committee (NEC) of Secretaries has been created to assist the NDMA in the performance of its functions. At the State level, a State Disaster Management Authority has been created under the chairmanship of Chief Minister, which has been assisted by a State Executive Committee. At the District level, District Disaster Management Authorities have been created. The responsibility of laying down the policies on disaster management, approving the National Policy on Disaster Management (NPDMA) and laying down the guidelines on Disaster Management has been given to NDMA under the Act. The NDMA accordingly prepared a draft of the National Policy on Disaster Management in consultation with the Home Ministry and submitted the same for approval of the Government.

Thus, for the proposed project a robust Risk Assessment and DMP shall be prepared in line with policies and guidelines proposed and framed by NDMA and National Policy on Disaster Management to prevent any disaster and manage the emergency conditions post disaster.

## 1.3 DISASTER MANAGEMENT AUTHORITIES

Project officials shall coordinate with the central and state level and district level disaster management agencies (NDMA, SDMA & DDMA) to inform and manage the disaster if any as require for rescue, evacuation, hospitalization, tools and techniques etc.

## 1.4 AUTHORITY TO DECLARE DISASTER

PWD shall nominate and delegate adequate authority to higher officials for declaring an untoward incident as Disaster.

## 1.5 APPROVAL OF DISASTER MANAGEMENT PLAN

The Disaster Management Plan of Silverline will be submitted to the concerned Ministries of the Government of India and to the NDMA for comments, suggestions and approval and subsequent updating especially where there is an interface between 2 or more departments in the management of a disaster.

NDMA is mandated to lay down the policies, plans and guidelines for Disaster Management. India envisions the development of an ethos of Prevention, Mitigation, Preparedness and Response. The National Disaster Management Authority (NDMA), headed by the Prime Minister of India, is the apex body for Disaster Management in India. Setting up of NDMA and the creation of an enabling environment for institutional mechanisms at the State and District levels is mandated by the Disaster Management Act, 2005. The State Disaster Management Authorities (SDMA) headed by the respective Chief Ministers and the District Disaster

Management Authorities (DDMA) headed by the District Collectors/ District Magistrate and co-chaired by Chairpersons of the local bodies. In each State/ Union Territory (UT), there will be one nodal agency, for coordination of disaster management, which is referred in the plan as 'Disaster Management Department' (DMD).

## 1.6 ORGANIZATION CHART FOR DISASTER MANAGEMENT AT PWD

A competent authority comprising of qualified & experienced personnel shall form the authority responsible for maintaining safety and for prevention of hazards and risks of disaster during both construction and operation phase. Schematic organization chart for disaster management during construction and operation phase is given below. Roles and responsibilities of each shall properly be defined. Emergency action committee shall be formed during both construction and operation phase by PWD and shall be made part of disaster management organization cell.

## 1.7 RISKS AND DISASTERS DURING CONSTRUCTION PHASE

During construction phase, all workers, staff and the surrounding community is subjected to various risks. Different risks and disasters during the construction phase are discussed below

a) **Risks Due to Construction Works:** Due to usage of complex machinery and construction activities involved, there is high risk involved during project construction. Construction workers and surrounding community are at risk of being affected due to failure of machinery or collapse of these structures. There is a high probability of occurrence of accident/disasters including a fatality if the safe work conditions are not maintained at site. Further the probability of an accident due to existing road traffic while working on the project cannot be ruled out. Workers and surrounding community are at a high risk of developing diseases which may occur due to continual exposure to the dust and noise generated due to the construction works. Some of the diseases may include temporary deafness, sleep disorders, respiratory disorders like silicosis etc. Thus, it is required to administer several controls to provide safe working condition, minimize the probability of accidents and preventing the outbreak or spread of diseases.

Other occupational risks may include spread of diseases, epidemic and STDs due to unhygienic conditions at site, having improper sanitation system and lack of awareness among the workers on impact and prevention measures of these disease. These diseases may also become threat to surrounding community.

Other risks may include exposure of workers, staff or community to the chemical hazards like paints, hazardous chemicals etc being used during construction, may affect their health and well-being.

b) **Natural Disaster:** Proposed project traverses through Manipur states of India and probable natural disasters in these areas majorly includes floods, landslides, earthquakes (Zone V), erosion and wind. The project alignment traverses various water bodies. But the project infrastructure is being designed above HFL to prevent damage due to these disasters.

c) **Manmade Disaster:** Men and property of project also has potential threat due to the man-made disasters like fire due to short-circuiting, improper handling of inflammables etc., acts of terrorism and sabotage causing deliberate loss of life and/or damage to project property or putting on fire, bomb blast, Chemical attack, Biological, Radiological and Nuclear Disaster.

### 1.7.1 Operational phase

During operation phase, workers, staff, passenger and surrounding community will be subjected to various risks which are discussed below

a) **Accidental Risks:** Risks associated with the operation are: road accidents due to high speed, poor junction design, improper safety infrastructure, inadequate lighting etc.

b) **Natural Disaster:** Proposed project traverses through Manipur states of India and probable natural disasters in these areas majorly includes floods, earthquakes (Zone V), landslides, lightning, erosion, and wind. The project alignment traverses through various water bodies but the project infrastructure is designed above HFL to prevent damage due to these disasters.

c) **Manmade Disaster:** Men and property of project also has potential threat due to the man-made disasters like fire due to short-circuiting, improper handling of inflammables etc., acts of terrorism and sabotage causing deliberate loss of life and/or damage to project property of putting on fire, bomb blast, Chemical attack, Biological, Radiological and Nuclear Disaster.

## 1.8 DISASTER MANAGEMENT SYSTEM FOR PROPOSED PROJECT

There may be emergency conditions arising because of many reasons such as natural disasters, fire, accident etc. This section details about the safety measures to be implemented to cater the emergency conditions safely. Safety Measures during Construction Phase

### 1.8.1 Safety Measures Due to Construction Works

As discussed in the section above, various risks are associated with the construction works of project. Various hazards and the risk control measures associated with different project activities are discussed in the table below.

**Table: Risk and hazards during the construction phase**

Hazards	Risk Control Measures
1. Exposure to or contact with underground utilities (electrical cable, pipeline, etc)	<ol style="list-style-type: none"> <li>1. Engineering drawings and site excavation plan shall be referred prior undertaking any excavation or utility shifting.</li> <li>2. Identify the utility using utility detectors or Do trial pits to locate the utility and divert it before excavation.</li> <li>3. Obtain Excavation Permit from Engineer/Supervisor and he/she shall be responsible for any violation of the requirement</li> <li>4. PPEs like Insulated tools, rubber hand gloves, mask, goggles and safety shoes shall be provided to workers handling the UG utilities</li> <li>5. Use hand digging initially till underground facility located if drawings not available.</li> </ol>
<ol style="list-style-type: none"> <li>1. Working at height</li> <li>2. Lack of knowledge</li> <li>3. Improper supports</li> <li>4. High noise</li> <li>5. Flying partials</li> <li>6. Electricity</li> <li>7. Slip &amp; trip,</li> </ol>	<ol style="list-style-type: none"> <li>1. Safety Induction, competency training</li> <li>2. Follow work method statement</li> <li>3. Trained work force</li> <li>4. Tool box talk.</li> <li>5. Provide suitable working platforms with hand railings.</li> <li>6. Use standard scaffoldings and support structure designed for the intended load.</li> <li>7. Ensure wheel guard for grinding machine, Dead man switches for the grinding machine,</li> <li>8. Maintaining electrical appliances, machines and cables in good condition, provide circuit breakers, earthing and grounding, conducting regular electrical audits and provision of PPEs</li> <li>9. Maintain Proper House-keeping.</li> <li>10. Use tight fit safety goggle for the job.</li> <li>11. Use ear protective muff. Post ear protection signage.</li> </ol>
<ol style="list-style-type: none"> <li>1. Manual handling of cement bags.</li> <li>2. Physical contact with cement slurry or wet concrete</li> </ol>	<ol style="list-style-type: none"> <li>1. Position the machine on a firm level ground with proper anchoring.</li> <li>2. Use mechanical means to carry cement bags from go-down to site.</li> <li>3. Use safe method of manual handling.</li> <li>4. Helmet/Goggle/Safety shoes/Hand gloves.</li> </ol>
<ol style="list-style-type: none"> <li>1. Unstable ground for staging crane/heavy machinery</li> <li>2. Equipment failure.</li> <li>3. Toppling of machine.</li> </ol>	<ol style="list-style-type: none"> <li>1. Ground condition shall be made suitable for crane and other heavy machinery.</li> <li>2. Outriggers of the crane shall be fully extended &amp; load bearing pads shall be used during lifting operation.</li> <li>3. Crane operator has to assess lifting area with rigging supervisor before lifting operation.</li> <li>4. Lifting shall not be allowed in harsh weather condition.</li> <li>5. All lifting tools, tackles shall be protected from sharp edge to avoid damage to slings.</li> <li>6. Sufficient taglines shall be used with lifting load to avoid swinging the load.</li> <li>7. The lifting capacity of rigging appliances vs. job to be lifted shall be evaluated about its safe lifting.</li> <li>8. All lifting gears shall have load tested and third party inspected.</li> <li>9. Crane shall be equipped with Automatic Safe Load Indicator.</li> <li>10. Administrative control measures such as implementation of lifting plan and lift permits, administering training and awareness, provision of barricading , inspection and audits, use of appropriate PPEs etc. shall be done.</li> </ol>
1. Incompetency/untrained human resources Injury to workers	<ol style="list-style-type: none"> <li>1. HSE Induction training to be imparted and should be in possession of HSE Induction card.</li> <li>2. Specific training on “Confined Space Entry” to be imparted.</li> <li>3. Only physically and mentally fit persons shall be allowed entering the confined space.</li> <li>4. Display cautionary board at all required/hazardous locations.</li> <li>5. Tool Box Talk to be conducted.</li> <li>6. Ensure communication system.</li> <li>7. PTW to be followed.</li> <li>8. Ensure the emergency rescue procedure and resources are available and workers are aware and properly trained.</li> <li>9. Use proper standard tools, do not use fabricated tools</li> <li>10. Use plant and machinery wherever possible instead of manual lifting.</li> </ol>
1. Unsafe Storage and Handling of gas cylinders Fire and Explosion	<ol style="list-style-type: none"> <li>1. Always store the cylinders in an upright position and chained.</li> <li>2. The cylinder should have valve cap/guard.</li> <li>3. Fire protection and firefighting system to be available.</li> <li>4. No smoking board should be displayed.</li> </ol>

Hazards	Risk Control Measures
	<p>Cylinders should not be rolled on the ground or dropped down from the vehicle.</p> <ol style="list-style-type: none"> <li>5. Gas cutting to be done by the trained gas cutter</li> <li>6. Oxygen and acetylene cylinders shall be stored separately in upright position and well secured, with related signs, in weather protection shed.</li> <li>7. Gas cylinders and hoses should have colour code.</li> <li>8. Clamps/jubilee clips should be used for connecting hoses.</li> <li>9. Cap/guard shall be fixed when the cylinder not in use.</li> <li>10. Valve guard should be fixed when cylinders are in use.</li> <li>11. Ensure ISI/CE marked flash back arrestors are installed to the cutting torch as well as cylinder side</li> </ol>
12.Fire	<ol style="list-style-type: none"> <li>1. In compliance with national fire safety legislation the person responsible for the fire safety management system and inspections must ensure that a fire risk assessment is undertaken and is reviewed and updated regularly as construction proceeds.</li> <li>2. Proper liaison shall be maintained with the fire emergency services</li> <li>3. Proper access for fire tenders shall be ensured all the time at site and camps</li> <li>4. Fire tanks shall always be filled with water and shall be provided at construction site, storage yards, site offices, labour camps and other project related facilities inline with the NBC and local fire authority requirements</li> <li>5. Firefighting equipment like extinguishers (required category), fire blankets, sand buckets etc shall be available 24X7 at the site</li> <li>6. Fire alarms shall be provided at sites, camps, storage areas etc to alert workers and staff about fire</li> <li>7. Staff shall be trained properly to use machinery, upkeeping of wires/cables/cable box, inflammable materials, fire extinguishers, communication of fire hazard and on prevention of fire</li> <li>8. Temporary and permanent structures to be constructed shall be fire resistant and shall be selected as per NBC requirement.</li> <li>9. All wires to be used shall preferably be fire resistance.</li> <li>10. All machinery shall be provided with proper earthing and ELCBs.</li> <li>11. All electrical installations shall be undertaken by experienced electrician only</li> <li>12. Site shall be inspected on daily basis for checking all equipment and circuits. Where possible, main switches, other than those controlling security and automatic fire detection systems, should be turned off when work ceases and all equipment be unplugged when not in use</li> <li>13. Emergency procedures shall properly be framed and communicated to all staff and workers</li> <li>14. Assembly areas shall be defined in advance for gathering in case of fire. Access to assembly area shall not be blocked. It should preferably be open area with no hazard of fire</li> <li>15. Proper fire exit signages and fire extinguisher signages shall be provided at offices, camps, fuel/inflammable storage areas etc. Gated access shall be provided to the areas like storage yards, inflammables etc to minimize fire hazard and only authorized personnel shall be allowed</li> <li>16. Flammable material should be removed or covered with fire retardant blanket.</li> <li>17. Gas cylinders shall be always kept upright and shall preferably be outside the buildings. Acetylene cylinders shall always be stored at locations away from offices, storage area, labour camp to minimize the risk to men</li> <li>18. Gas Welding and procedures shall be done by trained welder, not by helper</li> <li>19. Alternative methods to hot work should be adopted wherever possible. Where hot work cannot be avoided adequate safety measures shall be adopted. Only trained personnel shall be allowed to do hot works</li> <li>20. A 'permit-to-work' system must be adopted where welding and hot work is being undertaken unless there is no risk of damage to any surrounding property.</li> <li>21. Ensure proper house keeping all the time.</li> <li>22. Ensure that all cables, electrode holder, electrode ovens are in good conditions.</li> <li>23. Welding return to be connected with proper clamp to job as close as possible from the welding joint.</li> <li>24. Never place electrode oven on wooden surface when in use.</li> <li>25. Electrode stubs shall be properly collected in containers, tins.</li> <li>26. Toolbox talks before starting the job.</li> </ol>

Hazards	Risk Control Measures
	27. Weather protection shed to be provided for welding machine. 28. Welding cables should be coiled properly and to be routed away (segregated) from power cable. 29. Stationary plant powered by internal combustion engines, such as compressors and generators, should, wherever practicable, be positioned in the open air or in a well-ventilated non-combustible enclosure. They must be sited so that exhaust pipes and exhaust gases are kept clear of combustible materials 30. Fuel tanks must not be filled whilst engines are running. 31. Smoking and use of kerosene and making open fires shall strictly be prohibited in camps, sites etc 32. Proper maintenance of equipment, machinery, cables, circuits shall be done and the parts shall be replaced as and when required 33. Proper ventilation shall be maintained in area especially housing heat generating equipment 34. Mock drills shall regularly be conducted for workers and staff to make them aware about handling fire emergency situation
13. Working adjacent to Traffic /Public	1. Work area barricading shall be provided to prevent unauthorised entry 2. Assess the Traffic Risk and identify vulnerable areas and specific measures. 3. Barricading should be fixed first with retro reflective's and blinker lighting as per requirement. 4. Sufficient Traffic Marshal shall be deployed and they shall be adequately trained. Marshals With red flag or Baton light, reflective jackets shall be engaged. 5. Adequate Road signage shall be displayed as per IRC. 6. Manage rash night traffic by placing ZIG ZAG barrier, placing Impact Protection Vehicles and any other best means. 7. Designate road cross areas, take preference to existing zebra crossings. Avoid curve/bend areas for road crossing. 8. Provide low height (say 1m) barricades at crossings to prevent blind spot for both drivers & pedestrians. 9. Educate site team on safe behaviour on road. 10. Where possible, install convex mirror on blind spot areas.

**Source: Study team**

Other than the measures tabulated above, some general safety measures required at site are given below:

- Safe work method statement including Hazard Identification and Risk Assessment (HIRA) shall be prepared and implemented for all the construction activities
- Provision of adequate fire detection and firefighting system at the site like extinguishers, sand buckets, fire blankets, usage of fire-resistant materials/wires etc
- Contractor shall prepare emergency preparedness plan in line with this plan to handle any contingency due to construction accidents and natural or man-made disasters like earthquakes, floods and dust storms
- Contractor shall develop traffic management plan to prevent any traffic related accidents at or outside the site. Contractor shall provide defensive training to the drivers to minimize the accidents
- Contractor shall follow the safety measures as per relevant IRC codes
- Contractor shall fence all electric points to minimize electrocution risk and shall also provide proper earthing, proper warning signs and conduct security patrols.
- Contractor shall ensure provision of safe work environment, provision of competent supervision, provision of safe equipment & machinery and provision of proper training to ensure safety at work site
- Contractor should appoint an agency to provide awareness about the prevention of STDs among the workers. The agency shall work in close coordination with NACO and SACS for organizing the awareness campaigns. Workers shall be provided with the condoms and diaphragms as required for minimizing spread of STDs
- Regular home visit holidays shall be given to the workers to ensure their proper mental health.
- All workers shall be provided with job specific training, behavioural based safety training and awareness for ensuring the safety.
- Smoking shall be prohibited at the site to prevent the health and fire hazard
- All construction sites should be barricaded with proper tamper proof fencing & security lighting and conduct regular security patrols and other security measures. All the construction activity and storage of



material shall be strictly within the RoW. All hazardous chemicals & waste and explosives (if any) shall be stored as per the guidelines in the respective laws

- Avoiding usage of the chemicals or paints which may impact the health of the workers or community and shall encourage use of the VOC free paints etc. No banned material like asbestos shall be used at the construction site
- All workers and staff should be provided with Personal Protective Equipment (PPE) like safety jackets, helmets, gloves, goggles, life jackets in case of work on/near water body appropriate to their job on site to minimize exposure to the hazards
- Coordination with local police to curb the anti-social activities and usage of drugs & narcotics.
- Contractor will have regular monitoring and audits/inspection system for ensuring effective implementation of safety management system and shall ensure continuous improvement of its safety management system.

## **1.8.2 Safety Measures For Managing the Natural Disasters**

### **1.8.2.1 Earthquakes**

Since the project alignment traverses Zone V, i.e. zones of very high risks, there are risks of earthquake occurrence in the project area. Impacts due to earthquake may include collapse of permanent or temporary structure, failure of heavy machinery, failure of electrical cabling system at site etc. To prevent the impact on property and lives due to earthquake, following measures shall be taken. The measures are listed below

#### **Measures for Prevention of Disaster Due to Earthquake:**

##### ***For temporary facilities During Construction***

- Light material shall be used for construction of temporary structures required during construction
- BIS and NBC codes shall be followed for selecting the material for construction and carrying out construction for the respective seismic zones
- All the shelves shall be fastened to the walls
- Heavy items shall be stored away from bedding and sitting areas in labour camps and offices
- Overhead lighting and fan fixtures shall be braced and anchored to ceiling
- Secure the cylinders, gas pipelines properly so as they do not topple off or bend due to an earthquake
- Identify a safe assembly area which should be open for workers and staff to accumulate during an earthquake
- Emergency contact numbers shall be displayed at site (Fire, disaster management authority, hospital, police stations) in local and English language along with contact numbers of emergency incident controllers at site
- Conduct mock drills regularly and include communication trainings as well in the drills

#### **Measures during Earthquake**

Workers & staff should be trained for taking the following measures during the earthquake

##### **If Indoors**

- Drop to the ground; take cover by getting under a sturdy furniture; and hold on until the shaking stops. If there is no a sturdy furniture near-by, cover the face and head with arms and crouch in an inside corner of the building.
- Protect by staying under the lintel of an inner door, in the corner of a room, under a table or even under a bed.
- Stay away from glass, windows, outside doors and walls, and anything that could fall, (such as lighting fixtures or furniture).
- Stay in bed if one is there when the earthquake strikes. Hold on and protect the head with a pillow, unless one is under a heavy light fixture that could fall. In that case, move to the nearest safe place.
- Use a doorway for shelter only if it is in close proximity to you and if you know it is a strongly supported, load bearing doorway.
- Stay inside until the shaking stops and it is safe to go outside. Research has shown that most injuries occur when people inside buildings attempt to move to a different location inside the building or try to leave.
- Be aware that the electricity may go out or the sprinkler systems or fire alarms may turn on.

### **If outdoors**

- Do not move if one is in open space. However, move away from buildings, trees, streetlights, and utility wires.
- The greatest danger exists directly outside buildings; at exits; and alongside exterior walls. Most earthquake-related casualties result from collapsing walls, flying glass, and falling objects.

### **If in a moving vehicle**

- Stop as quickly as safety permits and stay in the vehicle. Avoid stopping near or under buildings, trees, overpasses, and utility wires.
- Proceed cautiously once the earthquake has stopped. Avoid roads, bridges, or ramps that might have been damaged by the earthquake.

### **If trapped under debris**

- Do not light a match.
- Do not move about or kick up dust.
- Cover mouth with a handkerchief or clothing.
- Tap on a pipe or wall so rescuers can locate you. Use a whistle if one is available. Shout only as a last resort. Shouting can cause inhaling of dangerous amounts of dust.

## **1.8.2.2 Floods**

Project area is prone to floods as the area traverses through various rivers. Impacts due to flood may include washing off men and property, collapse of permanent or temporary structure, failure of heavy machinery vehicles, failure of electrical cabling system, etc. To prevent the impact on property and lives due to floods, following measures shall be taken. The measures are listed below

### **Measures for Prevention of Disaster Due to Flood/Cyclones:**

- IMD red alerts related to rains and flood shall regularly be followed. Works shall be stopped at sites which falls in the flood prone zone on the basis of red alerts received from time to time.
- Some recommended design measures to prevent impact of flood on structures to be constructed are given below
  - All temporary and permanent structures shall be planned above the defined HFL of the nearby waterbodies in whose flood plain the project lies
  - Identification of Flood Shelters at suitable locations so as men and material can be shifted to these location during floods
  - Training on Flood Management to officials
  - Emergency response team on floods shall specifically be formed for both construction and operation phase.
  - Study on changes in rainfall pattern and flood occurrence in the region
- Material/debris storage, machinery staging and establishment of labour camps/rest shelter shall not be done within the area prone to flood
- Flood shelters shall be identified for housing men and material in case of floods. Men and material shall be transferred to identify shelters before flood. All utilities of the basic needs shall be stocked/provided in these shelters. Flood shelters should be identified in areas above HFL only
- Emergency contact numbers shall be displayed at site (Fire, disaster management authority, hospital, police stations) in local and English language along with contact numbers of emergency incident controllers at site
- Clean all the drains and tanks prior onset of monsoon and remove the stacked soil/debris/top soil/muck from all the locations prior onset of monsoon to facilitate easy flow of storm water
- All the temporary structures constructed on water bodies shall be removed/dismantled prior onset of monsoon
- Borrow pits and excavated area shall be closed prior onset of monsoon. If not then they should properly be covered with tarpaulin to reduce the silt load

### **Measures during Floods:**

- If trapped in flood area, men and essential material of need shall be shifted to the top floor of the building
- Going out in water during floods shall strictly be avoided

- Site incident controller and disaster management authorities shall be contacted for rescue and help immediately after striking of flood
- Mock drills shall be provided to workers and staff to handle flood emergency situation. All staff and worker shall be trained to handle the emergency situation

### 1.8.3 Safety Measures For managing the man-made Disasters

#### 1.8.3.1 Fire

Fire is the most common man-made disaster which may happen at any location. Reasons for fire can be human error or failure of fire prevention system. Measures related to prevention of fire are already discussed in Table above. Measures to be taken during fire are discussed below

##### Measures during Fire

- All workers and staff shall preferably evacuate the fire affected area at the earliest and approach the assembly area
- Fire alarm shall be raised immediately on sighting the fire
- Cover the mouth and nose with wet cloth to prevent inhaling of smoke while evacuation or if trapped
- Lie down on floor if trapped inside to minimize inhaling of smoke
- All the electrical circuits and fuel supply shall be switched off to prevent further aggravation of fire
- Fire emergency services and site incident controller shall immediately be informed
- On knowing the source of fire, correct fire extinguisher or sand or fire blankets can be used to control the fire
- Adequate distance shall be maintained from the facility on fire. If inflammables are stored then no one shall be allowed within 100 m radius of the facility on fire

#### 1.8.3.2 Act of terrorism/Sabotage/Chemical Attack/Biological/Radiological and Nuclear Disasters

To minimize the impact of such disaster, staff workers must be well aware about the procedure to be followed. Thus, it is important to train the staff & workers and organize regular mock drills for them. Measures to be taken at the time of this disaster are discussed in paragraph below.

All the work sites shall be closed immediately after getting information about any such disaster. All works shall be terminated immediately. Site incident controller shall inform the head of the organization, police and concerned disaster management authority immediately. It will be responsibility of project in-charge to maintain calm at that time using best of his experience to assure zero casualties.

#### 1.8.3.3 Biological Disaster

Biological disasters might be caused by epidemics, accidental release of virulent microorganism(s) or Bioterrorism (BT) with the use of biological agents such as anthrax, smallpox, etc. The existence of infectious diseases has been known among human communities and civilizations since the dawn of history.

In recent times travelling has become easier. More and more people are travelling all over the world which exposes the whole world to epidemics. As our society is in a state of flux, novel pathogens emerge to pose challenges not only at the point of primary contact but in far removed locations. The increased interaction between humans and animals has increased the possibilities of zoonotic diseases emerging in epidemic form.

**Measures:** The essential protection against natural and artificial outbreaks of disease (bio-terrorism) will include the development of mechanisms for prompt detection of incipient outbreaks, isolation of the infected persons and the people they have been in contact with and mobilisation of investigational and therapeutic countermeasures. In the case of deliberately generated outbreaks (bio-terrorism) the spectrum of possible pathogens is narrow, while natural outbreaks can have a wide range of organisms. The mechanism required however, to face both can be similar if the service providers are adequately sensitized.

#### 1.8.3.4 Chemical (Terrorist) Disaster

A terrorist attack involving chemical agents differs from a normal terrorist attack as it results in specific effects on health and can cause fatal injuries, create panic, and affect the morale of the community. The targets of terrorists include market places, densely populated areas, public functions, important dignitaries, water and electricity supplies, restaurants/food plazas, malls, places of entertainment along the road and critical and sensitive military, civil and economic institutions.

Chemical terrorism is an act of violence to achieve professed aims using chemical agents. These chemical agents include poisonous gases, liquids or solids that have a deleterious effect on the biotic and non-biotic environment. Due to the relatively easy availability of hazardous chemicals in Major Accident Hazard units, storages and during transportation, terrorists can procure chemicals or even try to sabotage the facilities or transport vehicles as it offers them an easier and often more catastrophic method of anti-national activity. The mode of dispersal used for chemical agents would range from dissemination of aerosolised material to

contamination of food and water.

The possibility of a chemical terrorism attack can be minimized by spreading general awareness and building the capacity of the community, institutions, and governmental and non-governmental organisations.

**Measures:** Preparedness for an emergency response at the incident site requires protection, detection, and decontamination. RPF and the Medical Department have a role to play in the relief and mitigation efforts. A well-orchestrated medical response to CTD will be possible only by having a command-and-control function at the divisional level by the Medical Department. The CMO/CMS will be the main coordinator for the management of CTD.

#### **1.8.4 Safety Measures during the Operation Phase**

Road projects involves risk of accidents which may be due to over speeding, drink & drive issues, poor junction and curve geometry, existence of pot holes, unavailability of crash barriers and other safety infrastructure. To minimize the risks following measures shall be taken

- Prescribe the speed limits for each type of road and the same shall be displayed on each road at regular intervals
- Conduct regular patrol to identify the encroachments and remove any encroachments found on immediate basis
- Any life threatening tree if noticed shall be reported and applications shall be submitted to forest department for its removal on immediate basis
- All safety infrastructures like signals, rumble strips, crash barriers, solar blinkers, lighting etc shall be provided. Proper maintenance of this infrastructure shall be ensured
- Proper NMT infrastructure including wide footpath shall be provided for pedestrian movement. Signals shall be provided at each pedestrian crossing
- Pedestrian overpass and underpass shall be constructed at appropriate distance to minimize accidents caused during road crossings
- Installation of CCTVs at signals, major crossings and almost on every street
- Awareness campaigns shall be run by Traffic Department in conjunction with PWD to make people aware about the benefits of safe driving, impacts of drunk & drive, impacts of excessive honking & overtaking, rules for overtaking, impacts of driving at high beam, impacts of breaking signals, impacts of using mobile phones/head phones and other gadgets during driving & walking. These campaigns shall be run on all media like radio/televisions/internets/posters to keep people aware
- Traffic safety week celebrations should be carried out to spread further awareness
- Adequate inspections shall be conducted by Traffic officers to check the compliance of traffic rules by the road users

#### **1.9 CONCLUSION**

This chapter describes the objectives of risk and disaster management, legal framework for disaster management, disaster management authority, risk and disaster in proposed project for disaster/emergencies such as land subsidence, accidents, fire hazards, structure collapses and natural Disaster like Earthquake, Storms, Floods, etc. during construction phase and road accident during operation phase.

***ANNEXURE - 13 - WASTE MANAGEMENT  
PLAN***

**ANNEXURE 13**

**WASTE MANAGEMENT PLAN**

**1.0 Purpose of the Plan**

The purpose of this plan is to provide guidance to Contractors on management of miscellaneous non-hazardous waste generated on the work sites during the construction and operation.

**1.1 Waste Management Plan during Construction phase**

During Construction mainly muck and debris will be generated due to the dismantling of the structures for the clearance of RoW and from the piling activities. Also, Plastic Waste, Hazardous Waste, Battery Waste, Bio-Medical Waste, E-Waste will also be generated. The management of all types of waste generated during construction phase can be managed/tread/disposed of as mentioned in the table below.

**Table 1.1: Waste Anticipated to be generated during Construction Phase**

S. No.	Type of Waste	Activities Involved	Concerned Regulation in India	NOC required	Treatment	Disposal
1.	Municipal Waste	Domestic Usage by Labour and Staff, Kitchen/food waste, packaging waste (only bio-degradable like paper, cartons), Vegetation Removal, Discarded PPEs like shoes, jackets etc.	Municipal Solid Waste (Management & Handling) Rules, 2016	NOC from local bodies	Composting of wet waste within site as feasible	If not treated to be given off to piggeries or to local bodies for disposal
2.	Plastic Waste	Packaging plastic & foam Waste, disposable plates/glasses, HDPE & PVC pipes & drums, buckets, tarpaulins, water tanks and Waste from the snacks packets & water bottles in canteen majorly, Discarded PPEs like goggles, helmets, harness etc	Plastic Waste Management Rules, 2016	NOC from local bodies	--	Handed over to recyclers or to be given to local bodies for disposal
3.	Construction and Demolition Waste	broken cement blocks, metal waste, wires, dried concrete, concrete slurry, discarded machinery & tools, plywood/planks, demolition debris etc.	Construction and Demolition Waste Management Rules, 2016	NOC from local bodies	--	Excataed material and demolition debris shall be re-used for road improvement works. Recyclable material shall be sold to the recyclers. Surplus shall be disposed off as per guidance of local bodies
4.	Hazardous Waste	Used engine and hydraulic oil, waste oil, greased cotton, empty paint tins, dried paint, dried cements, cement slurry, discarded hazardous chemicals, used transformer oil, air filters, bentonite	Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016 as amended	NOC from SPCB	--	To be given to BPCB authorised recyclers or to TSDF site for disposal

S. No.	Type of Waste	Activities Involved	Concerned Regulation in India	NOC required	Treatment	Disposal
		slurry (in case of geo-testing for piles for bridges) etc.				
5.	Battery Waste	Lead Acid batteries in vehicles	Battery Waste Management Rules, 2022	NOC from SPCB/CPCB	--	To be sold to recyclers
6.	Bio-Medical Waste	Waste from first aid kits in labour accommodation/site area, vehicles & ambulance etc.	Bio-Medical Waste (Management and Handling) Rules, 2016	NOC from SPCB/CPCB	--	To be disposed off through authorized recyclers and disposal site
7.	E-Waste	Used electronic appliances like laptops & its accessories, computers & its accessories, printers, ACs, Xerox machines, Microwaves, Induction, Digital gauges etc. from site office	E-waste (Management) Rules, 2016	Return to be filled and submitted to SPCB/CPCB	--	To be sold to authorized recyclers and disposal sites

### 1.2 Action Plan for waste management during construction phase

- Contractor shall follow and comply with all the rules pertaining to the management and disposal of waste in India as described in Table.
- Contractor shall obtain NOC for generation, management and disposal of all kind of waste generated from SPCBs and local bodies as applicable.
- Contractor shall follow the conditions of all the NOC obtained pertaining to the waste generation
- Waste generated at the site shall be segregated at source and treated or re-used at site to the extent possible. Recyclable materials shall be segregated and sold to the authorized recyclers. Reject fraction of waste shall be disposed-off through the authorized local waste management agencies in the area
- If local agencies/facility for waste collection and disposal are not available for municipal and C&D waste, in the project area then project proponent shall identify the sites for waste/construction debris disposal. Debris disposal sites shall be selected prior start of construction.
- Any hazardous materials to be used will also need to be stored and handled correctly to prevent spills and pollution. Hazardous material shall be stored in covered conditions only in the confined location and shall be provided with the containment for any spillage. Hazardous waste containers shall properly be marked and kept in isolated locations only. Hazardous waste transportation shall be carried out only through the authorized transporters and TREM card shall be maintained for transportation
- Effort shall be made to re-use C&D waste to the possible extent such as filling material for casting yards or other local construction projects. Surplus shall be sent for recycling to the recyclers or for disposal at approved sites
- Excavated soil shall be used for backfilling excavations and surplus shall be given to the other construction projects in vicinity or disposed-off to the C&D waste disposal site
- No dumping should be carried out outside the RoW including private and government land, road side, low lying areas, wetlands, water bodies, forest area, ecologically sensitive areas etc.
- All the workers engaged in waste management shall be provided with the adequate PPEs like jackets, gloves, masks, face shield etc
- Waste generation shall be minimized by providing adequate material storage and covering facility and providing training to the workers for proper handling of the material and machinery

### 1.3 Waste Management Plan during Construction Phase

Complying to the NMCG requirements and the Waste management rules, state has established various facilities for treatment of waste and waste water. There is one STP of 27 MLD at Lamphel and 2 STPs of 16 & 1 MLD under construction at Maibal Leikai (Imphal West) and Iroisemba (Imphal West). STP of 49 MLD is proposed to be constructed in Imphal. Other than a 400 KLD CETP is also functional at Nilakuthi Industrial Estate, Imphal. There are MSW treatment and processing facility in the state with the total capacity of 113 TPD. A facility of 5

TPD is also proposed to be constructed for treatment of C&D Waste. For bio-medical waste management, there is one common bio-medical waste management facility, 2 captive facilities and 391 nos of deep burial facilities.

### **1.3.1 Municipal Waste Management Plan**

Municipal waste during construction and operation phase of the the proposed project. Municipal waste will be disposed off through Municipal Corporation or urban local bodies in urban areas and through local waste management agencies in the rural areas after obtaining the requisite permission. If agencies or facility for waste collection & disposal are not available, then contractor shall identify and develop the sites for municipal waste disposal in consultation with local bodies and as per the selection criteria given in Appendix A. Municipal waste disposal sites shall always be at distance from water bodies, should be above HFL, should be away from residential, sensitive and ecological sensitive areas and shall properly be fenced, lined and drained to prevent the environmental pollution.

Municipal waste can also be segregated at the source into the compostable, recyclable, reusable and rejects. Composting of the waste can be done within the site/premises using the organic waste convertors. Organic waste convertors are compact machineries and are widely available which can help in converting the waste to useful manure in short period of time. Natural process based organic waste convertors only shall be used and heat based shall be avoided. Recyclable fractions can be sold to authorized local vendors, re-usable material can be stored separately at the site in covered condition on paved surface for re-use at sr ite. Rejects can be handed over to the agencies or can be disposed off at the identified locations. Transportation of waste shall always be done in covered condition. All waste carrying vehicles shall always be covered with tarpaulins. Waste storage bins and vehicles shall be loaded only to 95% of their capacity to prevent spillage. Storage of the municipal waste shall not exceed max 2 days at site/premises to prevent the foul smell, degradation of waste and generation of leachates.

### **1.3.2 Hazardous Waste Management Plan**

Hazardous waste which may generate at site may include used oil, waste oil, greased cotton, empty paint/admixture/chemical drums/boxes, rejected hazardous chemicals etc. Hazardous waste shall strictly be stored, managed and disposed as per Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016 as amended. Authorization shall be obtained for generation, storage and transportation of hazardous waste from the SPCB. Hazardous waste shall be disposed only through the authorized hazardous waste collectors by SPCB/MoEF&CC.

#### **A. Segregation of Hazardous Waste:**

Segregation of hazardous waste shall be done among the following basis:

- Acids and bases
- Flammables or combustibles and oxidizers
- Corrosives and flammables or combustibles

#### **B. Storage of hazardous and other wastes:**

Hazardous Waste shall not be stored for a period more than ninety days and record of sale, transfer, storage, recycling, recovery, pre-processing, co-processing and utilisation of such wastes shall be maintained. These records shall be available for inspection all the time at site/premises. The waste shall be stored in the containers strictly in compliance with the above mentioned rules.

#### **C. Packaging and Labelling:**

It should be ensured that hazardous and other wastes are packaged in a manner suitable for safe handling, storage and transport as per the guidelines issued by the Central Pollution Control Board from time to time. The labelling shall be done as per **Form 8**. The label shall be of non-washable material, weather proof and easily visible.

#### **D. Agreement for disposal of Hazardous waste:**

Hazardous waste shall be disposed off only through authorised vendor after agreement. Authorized vendors shall be identified and Agreement with the vendor shall be done prior generation of any hazardous waste

#### **E. Transportation of hazardous wastes:**

The transport of the hazardous and other waste shall be in accordance with the provisions of these rules and the rules made by the Central Government under the Motor Vehicles Act, 1988 and the guidelines issued by the Central Pollution Control Board from time to time in this regard.

The transporter shall be provided with the relevant information in **Form 9** (Transport Emergency (Trem) Card), regarding the hazardous nature of the wastes and measures to be taken in case of an emergency and shall label the hazardous and other wastes containers as per **Form 8**.

In case of transportation of hazardous and other waste for final disposal to a facility existing in a State other than the State where the waste is generated, the sender shall obtain 'No Objection Certificate' from the State Pollution Control Board of both the States.



In case of transportation of hazardous and other waste for recycling or utilisation including processing, the sender shall intimate both the State Pollution Control Boards before handing over the waste to the transporter.

In case of transit of hazardous and other waste for recycling, utilisation including processing or disposal through a State other than the States of origin and destination, the sender shall give prior intimation to the concerned State Pollution Control Board of the States of transit before handing over the wastes to the transporter.

In case of transportation of hazardous and other waste, the responsibility of safe transport shall be either of the sender or the receiver whosoever arranges the transport and has the necessary authorisation for transport from the concerned State Pollution Control Board. This responsibility should be clearly indicated in the manifest.

The authorisation for transport shall be obtained either by the sender or the receiver on whose behalf the transport is being arranged.

### **1.3.3 Construction and Demolition Waste**

Material from road improvement/rehabilitation shall completely be reused. Approx. 58425 cum of demolition debris will be generated from the proposed project. This Waste will be maximally re-used at site. Recyclable fraction shall be sold to the vendors and reject shall be disposed off through Municipal Corporation or urban local bodies in urban areas and waste management agencies in rural area. If no such agency/facility is available for disposal of C&D Waste then contractor shall identify the sites for construction debris disposal as per Appendix I. Effort shall be made to re-use entire C&D waste to the possible extent such as for construction, pitching, backfilling, redevelopment of borrow area/quarry or other local construction projects. C&D Waste including the concrete slurry/dried concrete shall not be dumped outside RoW including private/government land, water bodies, forest areas etc. Transit Mixer Washing, run-off from batching plant etc shall not be carried out at any location other than designated locations in batching plants. Proper sedimentation tanks shall be provided for the concrete slurry. Concrete can be re-used for various purposes or shall be disposed off appropriately.

### **1.3.4 Bio Medical Waste**

There may be occupational health centres at the site during construction phase. Bio-medical waste may be generated from these facilities. Bio-medical waste shall be stored, managed, transported and disposed strictly as per Biomedical Waste Management Rules 2016. Bio-medical waste shall be segregated into containers/bags at the points of generation in accordance with Schedule II prior to its storage transportation, treatment and disposal. The containers shall be labeled according to Schedule III. Bio-medical waste shall be disposed off only through the authorized vendors/agencies after obtaining requisite permission from SPCB

### **1.3.5 E Waste**

Collection, storage and disposal of E-waste shall strictly be as per the E-Waste (Management) Rules, 2016. All the compliance to be met by consumer/bulk consumer as applicable shall be followed. E-waste shall be disposed off only through the authorized vendors/agencies/recyclers as per the rules. Annual return shall be filed as per the requirement of the above mentioned rules.

### **1.3.6 Battery Waste**

Management of the battery waste shall strictly be as per the Batteries (Management & Handling) Rules, 2022. Batteries shall be returned back to the manufacturer. Annual return shall be filed as per the requirement of the above mentioned rules.

### **1.3.7 Plastic Waste**

Management of the plastic waste shall strictly be as per the Plastic Waste (Management & Handling) Rules, 2016.

## **Attachment A**

### **SELECTION OF WASTE/MUCK/DEBRIS DISPOSAL SITES**

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

- Disposal sites are located at least 500 m away from sensitive locations like Settlements, Water body, notified forest areas, Sanctuaries or any other sensitive locations.
- Disposal sites shall not contaminate any water sources, rivers etc so the site should be located away from water body and disposal site shall be above HFL of the water bodies & should be lined properly to prevent infiltration of water/leachate.
- Public perception about the location of debris disposal site has to be obtained before finalizing the location. Site shall preferably be located on the waste land. Agricultural or other land shall be avoided for establishment of debris disposal sites.
- Permission from the Village/local community/concerned authority is to be obtained for the Disposal site selected.

- Contractor shall submit the location, layout, design of debris disposal site along with the methodology of site preparation and disposal of waste to engineer incharge/PWD (as stated in other portions) for approval prior commencement of work. Only approved sites shall be developed for debris disposal.

#### **PRECAUTIONS TO BE ADOPTED DURING DISPOSAL OF DEBRIS / WASTE MATERIAL**

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

- During the site clearance and disposal of debris, the Contractor will take full care to ensure that public or private properties are not affected and that the traffic is not interrupted.
- The Contractor will dispose off debris only to the identified places only with prior permission of Engineer-in-Charge of works.
- Contractor includes sub-contractor or any contracted agency shall not strictly dispose off any waste outside RoW or identified and approved disposal sites. In the event of any spoil or debris from the sites being deposited on any adjacent land, the Contractor will immediately remove all such spoil debris and restore the affected area to its original state to the satisfaction of the Engineer-in-Charge of works.
- The Contractor will at all times ensure that the entire existing canal and drains within and adjacent to the site are kept safe and free from any debris.
- Contractor will utilize effective water sprays during the delivery and handling of materials when dust is likely to be created and to dampen stored materials during dry and windy weather.
- Materials having the potential to produce dust will not be loaded to a level higher than the side and tail boards and will be covered with a tarpaulin in good condition.
- Any diversion required for traffic during disposal of debris shall be provided with traffic control signals and barriers after the discussion with local people and with the permission of Engineer-in-Charge of works.
- During the debris disposal, contractor will take care of surrounding features and avoid any damage to it. No hazardous material, bio-medical waste, e-waste shall be disposed off at these sites.
- While disposing debris / waste material, the Contractor will take into account the wind direction and location of settlements to ensure against any dust problems.

#### **GUIDELINES FOR REHABILITATION OF DISPOSAL SITES**

No disposal site shall be filled beyond the approved level or the ground level whichever is lower and could be rehabilitated as per guidelines below and to be decided by the Engineer in-charge and the supervision consultant

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

***ANNEXURE - 14 - TRAFFIC MANAGEMENT  
PLAN***

**TRAFFIC MANAGEMENT PLAN**

**Introduction**

Project majorly lies in urban settings of the Manipur state. Project implementation will add to traffic in the project area and also traffic congestion will increase on the roads where excavation is planned, dismantling will be undertaken, and other project activities will be undertaken. Thus, it is required to manage the traffic arising due to project and the project activities due to which traffic congestion shall be prevented.

**Scope and Purpose**

The plan addresses labour and community safety related impacts that may arise from the increased project traffic, due to movement of heavy equipment/machinery and vehicles along the site access and approach roads particularly during construction phase. The plan will be regularly updated by the contractor with the project progress and as vehicle & equipment movement requirements are identified in detail. Designated traffic coordinator will be responsible for overall coordination of traffic management.

**Excavation Plan**

- Excavation shall be planned in consultation with the traffic police department
- Excavation shall not be taken up parallelly on both the edges on the same road
- Excavation shall not be undertaken during festival time
- Excavation shall not be undertaken during monsoon season
- Excavation shall not be undertaken on both the access of any cultural, archaeological, institutional, religious and hospital property
- Alternate access shall be provided to the property for which access is blocked
- Alternate route shall be defined, if any particular road is partially or completely blocked
- Public shall be informed about the blocked routes in advance
- Traffic supervisors shall be appointed on the route where the route blockage is carried out to guide the traffic

**Traffic Management**

The following measures will be implemented during this phase:

- Movement of construction material & debris carrying vehicle will be restricted to defined access routes & defined hours avoiding the peak hours
- Proper signage will be displayed at important traffic junctions along the vehicular access routes to be used by construction phase traffic. The signage will serve to prevent any diversion from designated routes and ensure proper speed limits are maintained near residential areas.
- Any road diversions and closures shall be done with the consultation of traffic police department
- Usage of horns by project vehicles will be restricted near sensitive receptors viz. schools, settlements etc.
- Traffic flows will be timed wherever practicable during period of increased commuter movement in the day.
- Temporary parking facilities shall be provided within the work areas, labour camp, material storage site, site office and other such areas
- Vehicular movement will be controlled near sensitive locations viz. schools, colleges, hospitals identified along designated vehicular transportation routes.
- Routine maintenance of project vehicles will be ensured to prevent any abnormal emissions and high noise generation.
- Adequate training on traffic and road safety operations will be imparted to the drivers of project vehicles. Road safety awareness programs will be organized in coordination with local authorities to sensitize target groups viz. school children, commuters on traffic safety rules and signages. Self-defensive training shall be given to drivers.
- Drivers shall carry the documents all the time including driving license, vehicle insurance policy, RC, Service records of vehicle, PUC, Name & Contact details of vehicle owner
- All vehicle shall be provided with first aid box
- The contractor(s) shall frame and implement a “No Drug No Alcohol” Policy to prevent road accidents/incidents.
- Traffic management plan shall be implemented by traffic supervisor under SHE cell’s head. Traffic marshals shall be kept at site to manage the incoming & outgoing traffic.
- Records of name of driver & number of vehicle shall be maintained at the site

***ANNEXURE - 15 - SITE REHABILITATION  
PLAN***

## ANNEXURE 15

### SITE REHABILITATION PLAN

#### 1. INTRODUCTION

Rehabilitation means developing your skills and capabilities and creating a living environment that supports independent coping. A rehabilitation plan will be drawn up for you that gives an assessment of your operational capacity and your need for help and lays down rehabilitation activities. Rehabilitation plan gives you a thorough summary of your rehabilitation possibilities.

Site Rehabilitation Plan is the key to ensure that the quality of life of the villagers does not deteriorate due to the construction of the project.

#### 2. OBJECTIVE & SCOPE

The purpose of the Site Rehabilitation Plan (SRP) is to develop procedures that will be implemented at site to meet the rehabilitation and environmental objectives associated with construction and management of the proposed project. Following are the major objective of the rehabilitation plan prepared by contractor:

- Minimize disturbance impact, wherever possible
- Integrate infrastructure development and rehabilitation schedules to maximize environmental outcomes;
- Maximize the use of rehabilitation resources available on site
- Provide prescriptions for restoration of landforms and associated vegetation
- Ensure that there is no drainage issue, flooding of quarry and borrow area, degradation in water, air and soil quality
- Construction waste is properly removed from site and no unauthorized dumping is done Site rehabilitation plan includes rehabilitation of:
  - Construction site
  - Stockpile yard
  - Accommodation camp
  - Borrow and quarry area
  - Site drainage and water bodies
- This site rehabilitation plan will act as a framework and provide guidelines for preparation of Site Rehabilitation Plan for each construction site, which shall be prepared by contractor and Site in-charges/Construction Managers. Site Specific Rehabilitation Plan shall be prepared prior to completion of construction work and shall be submitted to Engineer. The methodology adopted for preparation of Site-Specific Rehabilitation Plan shall include:
  - Defining Purpose and Scope
  - Assessing Environmental Setting
  - Identify Key Environmental Constraints
  - Preparing Implementation Strategy/ Work Plan
  - Monitoring

#### 3. LEGISLATIVE AND REGULATORY REQUIREMENT

Contractor shall comply with all applicable regulations required for establishment and compliance of plans. Contractor shall take all necessary applicable clearances from concerned authorities required under regulatory provisions. Contractor shall comply with legislative and regulatory requirement as applicable

#### 4. REHABILITATION OF CONSTRUCTION SITE

After completion of construction activity at site, contractor shall prepare the site rehabilitation plan for each construction site. The major activities include:

- Demobilization and removal of all the machinery, equipment; and other supporting infrastructures
- Filling of cuts, if any to maintain the slope and avoid any drainage issues after demobilization
- Surface roughening, if required to prevent soil erosion

- Handing over the land to its owner in its near original condition or as required by the owner (if Pvt land is acquired/leased/rented during construction activity)
- Tree plantation to maintain the aesthetics, soil quality, erosion control in area
- Clearing of pre-existing natural drains to avoid any drainage & flooding issues at site.
- Infrastructures such as buildings, water supply, etc may be left in situ, if desired by the landowner, otherwise all structures shall be demolished, and the debris shall be disposed of as per Construction waste management plan.
- All wells, sewage collection system & waste disposal pits, etc. shall be sealed and left in sanitary condition.
- All concrete waste and debris shall be removed and deposited at approved disposal site or shall be reused for filling of low lying areas.
- All trenches shall be filled
- All hydrocarbon waste, used oil, diesel storage tanks shall be removed and deposited at approved disposal sites.
- Inspection of site after demobilization to check the status of the site condition and approval of site closure by Engineer.

## 5. REHABILITATION OF STOCKPILE YARD

If not properly decommissioned, the temporarily storage yard may cause severe environmental impacts like Soil contamination, water pollution, increased run off etc. Contractor shall adopt all preventive measures while decommissioning the storage yard to ensure that no adverse impacts are envisaged. Following practices shall be adopted by contractor to prevent any impact on environment:

- All vehicles, machinery used in construction shall be demobilized from site
- If any oil spills and leakage occurs, that particular area shall be cleared and shall be managed as per Construction waste management plan
- Care shall be taken to ensure that no part, tools etc are left at storage yard
- All the fencing, if any, shall be removed
- The site shall be levelled to maintain the slope and natural drainage in the area.
- The cuts, if any shall be filled to avoid any water logging
- Site roughening, if required, shall be done to prevent soil erosion and decreasing run-off
- All borrow and quarry material shall be removed from site as extant as possible.
- Inspection of site after demobilization to check the status of the site condition and approval of site closure by Engineer.

## 6. REHABILITATION OF ACCOMMODATION CAMP SITE

Labour camp and staff colonies are the major source of Municipal solid waste and sewage generation. Therefore, good management practices shall be undertaken to avoid any post construction impacts on environment and human health at the site and nearby areas. Contractor shall develop and implement the redevelopment and rehabilitation plan for accommodation camp site.

Following measures shall be adopted by contractor to prevent any impact on environment and human health due to decommissioning of camp site:

- Oil and fuel contaminated soil shall be removed and transported and buried in waste disposal areas.
- Soak pits, septic tanks shall be covered and effectively sealed off (after emptying completely)
- Debris (rejected material) should be disposed off suitably as per Solid waste management plan
- Ramps, if created shall be levelled
- Underground water tank shall be filled to ground level
- If the construction camp site is on an agricultural land, topsoil shall be spread so as to aid faster rejuvenation
- If, on private land, the rehabilitation shall be done to achieve its nearby original condition or as per the

satisfaction of the owner after following above guidelines.

- Inspection of site after demobilization to check the status of site condition and approval of site closure by the Engineer / Employer.

## 7. REHABILITATION OF BORROW PIT AND QUARRY SITE

Borrow area and quarry are main source of construction material. The objective of the rehabilitation programme is to return the quarry /borrow pit sites to a safe and secure state. Securing borrows pits /quarry sites in a stable condition should be a fundamental requirement of the rehabilitation process. Following practices shall be adopted by contractor for effective rehabilitation of quarry and borrow area:

- Special quarry / borrow pit rehabilitation plan should be specified according to the location and shaping of the quarry slopes after exploitation and overburdened dump, with different subsequent uses e.g. meadow, water body etc., the re-greening and replanting methods.
- also, it can be developed as recreational space
- if located on Pvt. land, it shall be redeveloped and rehabilitated as required by the owner, considering all Preventive, control and management measures as mentioned in Borrow and Quarry Site Management Plan
- Prior consultation shall be done with local villages and other public representatives in the areas, before rehabilitating the borrow areas.
- All borrow areas shall be reinstated as per legal requirements, satisfaction of the land- owner.
- Other criteria which shall be followed for rehabilitation of quarry and borrow pits are:
- Quarries shall be backfilled with rejected construction wastes and will be given a vegetative cover.,
- If this is not possible, then excavation slopes will be smoothed and depression will be filled in such a way that it looks more or less like the original ground surface.
- Inspection of site after demobilization to check the status of the site condition.

## 8. REHABILITATION OF DRAINAGE AND WATER BODIES

The rehabilitation of water body shall be with the objective of restoring it to its original state or to a better state with necessary enhancement of its environs. Rehabilitation Plan shall include:

- Reconstruction and stabilization of slopes in case it is impacted
- Alternate excess to water body shall be provided if there is any interruption in use of existing due to construction activities.
- If the water body affected is a drinking water source for a habitation, arrangements shall be made to restore it to its original water quality.
- Plantation of trees around the water body to enhance the aesthetics and prevent degradation to water quality due to soil erosion.
- Inspection of site after demobilization to check the status of the site condition and approval of site closure by engineer.

## 9. GENERAL REHABILITATION MANAGEMENT

### Top-Soil Management

Effective topsoil management is a critical element of rehabilitation. Topsoil is the top-most layer (of the soil in undisturbed areas. This soil layer is important as it contains nutrients, organic matter, seeds, micro-organisms, fungi and soil fauna. All these elements are necessary for soil processes such as nutrient cycling and the growth of new plants. The biologically active upper layer of the soil is fundamental in the maintenance of the entire ecosystem.

Contractor shall ensure that the topsoil is properly managed and reused at site. The management includes:

- Topsoil should be retained on site in order to be used for site rehabilitation.
- Wherever possible, stripped topsoil should be placed directly onto an area being rehabilitated. This avoids stockpiling and double handling of the soil. Topsoil placed directly onto rehabilitation areas contains viable seed, nutrients and microbes that allow it to revegetate more rapidly than topsoil that has been in stockpile for long periods.
- If direct transfer is not possible, the topsoil should be stored separately from other soil heaps. The soil should not be stored for a long time and should be used as soon as possible. The longer the topsoil is stored,



the more seeds, microorganisms and soil biota are killed.

- If topsoil is stored on a slope then sediment fencing should be used downslope of the stockpile in order to intercept any sediment and runoff should be directed away from the stockpiles upslope.
- Stockpiles will be as low as possible with a maximum height of 2 meters and a slope of 2:1 (Horizontal to Vertical),

#### **Sub Soil Management**

The subsoil resource will be recovered to a maximum depth of 0.5 m below natural surface following topsoil stripping to ensure the minimum volume of topsoil and subsoil available for rehabilitation activities is realized. Subsoil will be direct returned to prepared rehabilitation surfaces where-ever possible, or stockpiled to less than 2 m in height at site.

In cases where the subsoil must be disturbed, it is essential that subsoil and topsoil be stockpiled separately, with a separation distance to ensure they are not mixed during construction or rehabilitation works. The equipment used for subsoil removal may be a scraper, excavator or dozer.

To minimize environmental issues associated with subsoil stockpiles the following measures will be adopted:

- Sub soil Stockpiles will be as low as possible with a maximum height of 2 meters and a slope of 2:1 (Horizontal to Vertical),
- subsoil will be stockpiled close to where it is stripped but away from the diversion or natural drainage flow paths
- adequate erosion and sediment control provisions will be implemented to prevent contamination of adjacent surface water sources; and

#### **Vegetation Debris**

Native vegetation removed during clearing of the site will be spread onto Rehabilitation areas. Care shall be taken to avoid/minimize compaction.

#### **Re-vegetation and tree Plantation**

The purpose of revegetation and Tree plantation is to ensure that areas cleared or impacted during construction activities of the proposed development are rehabilitated with a plant cover that reduces the risk of erosion from these areas as well as restores some ecosystem function. The purpose rehabilitation at the site can be summarized as follows:

- Achieve long-term stabilization of all disturbed areas to minimize ongoing erosion
- Topsoil shall be reused for rehabilitation of site
- Re- vegetate all disturbed areas with suitable plant species;
- Tree plantation shall be done considering the climatic conditions and in consultation with the Environmental officer and forest department
- Mulching may be provided in open and impacted areas
- Minimize visual impact of disturbed areas; and
- Ensure that disturbed areas are safe for future uses

It shall be ensured that the rehabilitation plan and the erosion and sedimentation control plan should function hand in hand as the two factors are inextricably linked.

#### **Species to be used for vegetation**

- The general aim of rehabilitation of an area is to return them to pre-disturbed land-use; therefore, re-vegetation of disturbance area shall be completed with specific considerations of pre-disturbance ecosystem requirement.
- Selection of plant species for areas to be rehabilitated will consider these species that will successfully establish on the available growth medium, bind the soil and will result in a variety of purpose/uses or habitat resources. Native species will be established through direct seeding or planting of nursery raised stock or from forest department. Seeds will be collected or sourced locally to ensure that it is adapted to environmental conditions in the area.
- A combination of native and introduced grass species may be used on the disturbance area to achieve the quick establishment of continuous ground cover, thereby, reducing the risk of erosion.
- Ground broadcasting of seed by hand is the preferred revegetation method and grazing may be restricted

whilst the vegetation is establishing.

- All revegetated areas will be inspected to ensure long-term vegetation establishment and successfully meeting rehabilitation criteria.

## 10. WASTE MANAGEMENT AND DISPOSAL

All temporary buildings and other infrastructures constructed earlier for project and other related activities shall be demolished. The Site huts, site offices etc. which are made up of light and recyclable material shall be dismantled and demobilized from site. Other permanent structures like concrete structures, walls etc. shall be demolished and shall either be sold off to recyclers or disposed off in a licensed landfill. Prior permission from local administration shall be taken before disposing any material.

## 11. INSPECTION & MONITORING

On completion of the final rehabilitation and closure works a Post closure Inspection/ monitoring will be carried out after one month at every site to ensure that the closure measures are robust, have performed adequately and that no further Environmental issues arise. The inspection shall be carried out by contractor and a compliance report shall be submitted to the Engineer. The Post closure inspection and monitoring by contractor include:

- Periodic inspection of the cover and vegetation for signs of erosion damage and failure of the vegetation establishment process;
- Re-planting of areas of vegetation where required;
- Periodic inspection and monitoring to confirm the effectiveness of the closure works in achieving the stated closure objectives.

The inspection shall be done by contractor to monitor the rehabilitation plan as per the checklist given below:

**Table Checklist for Site Rehabilitation Activities**

S.NO	POINTS	OBSERVATION	MEASURES/ REMARKS
1.	Are all machines and equipment removed from the site?		
2.	Is there any oil spill/leakage found un-addressed?		
3.	Are the soak pits and other underground tanks cleared and sealed?		
4.	Are all temporary structures demolished at site?		
5.	Are the debris and demolition waste collected and disposed off in an approved landfill/designated site?		
6.	Are all natural drains at site cleared and free from any obstruction?		
7.	Is site leveling done to maintain natural slope of the site?		
8.	Is there any danger in accessing Borrow and Quarry area?		
9.	Is soil erosion observed at site?		
10.	Is there any low lying area at site, left unaddressed?		
11.	Is there any water logging?		
12.	Is plantation done at site?		
13.	Is there any unauthorized dumping of waste, construction material etc at site?		
14.	Is there any impact on water quality of nearby resources?		
15.	Is there any hazardous waste left un-addressed at site?		
16.	Any other observation		
17.	Photographs		

After inspection, site restoration and rehabilitation report shall be submitted to the Engineer. After the rehabilitation is complete, a compliance monitoring will be carried out by report will be submitted to PWD/PMC in following format:

**Table Post Rehabilitation Monitoring Report**

Site Name		Signature
Demobilized on		
Site In-charge		

Project Manager	
EM/EO	
Monitoring Conducted On	
Engineers Representatives	

S.No	Rehabilitation Objectives	Performance Target	Measurement/P performance Indicator	Observation	Photograph
1	The rehabilitated land surface and soil properties are appropriate to support the target ecosystem. Appropriate topsoil replaced. Key fauna habitat returned	<ul style="list-style-type: none"> <li>Rehabilitated landforms will be consistent with adjacent landforms</li> <li>Soil profiles will be consistent with adjacent soil profiles</li> <li>Topsoil will be replaced from where it came, where practicable, or to a similar landform</li> <li>Surface soil is sufficiently rough and appropriately contoured to reduce erosion, encourage infiltration of rainfall, and trap seed and other resources</li> <li>Rates of erosion will be consistent with adjacent landforms.</li> </ul>	<ul style="list-style-type: none"> <li>Visual assessment of site topography and level</li> <li>Visual inspection for erosion</li> </ul>		
2	Vegetation in rehabilitated areas will have equivalent values as surrounding natural ecosystems. Return of recalcitrant species. Return of key fauna habitat	<ul style="list-style-type: none"> <li>Plant species are local provenance</li> <li>Plant species diversity, density, cover and height, floristic composition, and functional structure for sites rehabilitated will be consistent with the target vegetation community</li> </ul>	<ul style="list-style-type: none"> <li>Quantitative vegetation monitoring</li> <li>Record of vegetation</li> <li>/Tree Plantation</li> </ul>		
3	The rehabilitated area should be able to be managed in the same way as surrounding land.	<ul style="list-style-type: none"> <li>Rehabilitated landforms will be consistent with adjacent landforms.</li> <li>Plant species diversity, density, cover and height, floristic composition, and functional structure for sites rehabilitated will be consistent with the target vegetation community</li> </ul>	<ul style="list-style-type: none"> <li>Visual and survey assessment</li> <li>Quantitative vegetation monitoring</li> </ul>		
4	No Alteration to Existing Drainage Pattern in area	<ul style="list-style-type: none"> <li>The natural drainage of the site and surrounding is not obstructed.</li> <li>The Natural Drainage pattern of the site is not changed due to change on topography of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspection of the drainage pattern of the area.</li> </ul>		
5	Land Owner's Satisfaction	The Pvt. Land rehabilitated as per the owners requirement or to meet the actual site condition.	<ul style="list-style-type: none"> <li>Documentary proof, Interview/Consultation Documents or photographs or minutes of the meetings etc.</li> </ul>		
6	Waste/Debris	No waste/Debris will be disposed in any unauthorized manner: <ul style="list-style-type: none"> <li>Water Course</li> <li>Natural Drains</li> <li>Hill Slopes/Valleys</li> <li>Open Land</li> <li>Left Unaddressed</li> </ul>	Visual Site Inspection		
7	No Other Adverse Environmental and Social Impacts	There will be no other impacts, issues for local people and nearby habitats.	Discussion with local people or community		
Outcome of Monitoring: Recommendations/Suggestions etc.					

## 12. PLAN IMPLEMENTATION

Contractor shall implement the plan at construction site for effective implementation of site rehabilitation plan. It shall be the responsibility of the SHE team to conduct site inspection as per the checklist developed for each management plan. It will be ensured that:

- All management plans and control measures are successfully implemented at site
- Any observations made at site shall be recorded and reported to Chief SHE Officer
- All necessary actions have been taken at site to minimize any impact
- Any observations made by the engineer shall be reviewed and shall be compiled, if required

### 13. RECORDS KEEPING AND REPORTING

SHE team of contractor shall conduct regular inspection of the construction site after demobilization. The objective shall be to:

- Monitor the success of the rehabilitation measures implemented at site and
- To ensure that there are no adverse impact at site after demobilization.
- If any issues are observed at site, it shall be reported and conveyed to Chief SHE Officer for review and necessary action.

Proper documentation of rehabilitation site shall be done. This shall include the following:

- Photograph of rehabilitated site
- Inspection report/document of the rehabilitated site & T shall monitor the management activity and keep the records of monitoring and routine inspection. It shall be ensured that:
- A register or similar records/inspections documents shall be maintained
- Inspections records are kept available
- Any suggestions, observations made by the engineer shall be addressed, if found necessary.

### 14. TRAINING

Training shall be provided to site Engineers, supervisors and workmen at labor camp at site for effective management of Site rehabilitation plan. Training module shall be developed in coordination with Planning engineer and SHE staff. Environment official at site shall deliver the training to the Engineer and workmen at site. The topics to be covered in training shall include:

- Objective of training
- Area to be concern of site rehabilitation
- Rules and Regulations/guidelines
- Mitigation measures to C&D waste management
- Re-instate the site and ensure plantation.
- Do's & Don'ts
- Role & Responsibility of Individual
- Inspection & Monitoring
- Reporting

### 15. REVIEW

Environment managers shall review the plans if and when required. All regulatory and applicable guidelines shall be followed and required clearances shall be obtained. He shall ensure that:

- If any non-compliance to the management plan is observed, contractor shall review the same and shall take corrective measures to comply the same.
- Any observations made by the engineers shall be reviewed and shall be complied, if required.

### 16. GRIEVANCE REDRESSAL MECHANISM

Complaint associated with compulsory acquisition of land and property will be brought to notice to PWD and with mutual consultation with all parties involved, the issue will be amicably resolved through PWD.

Grievances/complaints on environmental matters are expected to be relatively few and straight forward so a simplified procedure will be followed. Local concerns which may arise as a result of inappropriate implementation of construction water management and implementation of rainwater harvesting, the main aim of which is the reduction of adverse impacts to acceptable levels. These issues will be best addressed through

open dialogue and a responsive approach, with acknowledgement of errors wherever appropriate, followed by rapid remedial action.

Any public complain and grievance with respect to generation of pollutants, inappropriate and inadequate pollution control measures, use of public resources such as water resource will be seriously dealt with. Once such notice and verbal/written complain notice, it will be brought to Project EHS committee and based on the severity of the complaint, it will be dealt with appropriate resolution and action plan. All such complains/grievances will be recorded along with the close outreports.

***ANNEXURE - 16 - STOCKPILE AND TOP-SOIL  
MANAGEMENT PLAN***

## ANNEXURE 16

### STOCKPILE AND TOP-SOIL MANAGEMENT PLAN

#### 1. PURPOSE

The stockpile area and Topsoil Management Plan has been developed to assist in the operation, maintenance and decommissioning stockpile for remedial activities at construction site. This plan shall be used in conjunction with the Safety Health and Environment Plan (SHE) Plan. The stockpile location will generally be identified at the beginning of the project and used throughout the construction period. Once the project is complete the stockpile will be de-commissioned, and the land restored back to near its original condition.

The main aim of temporarily storing the soil and other excavated material at stockpiles is to enable its reuse on site at a later stage, to minimize the surface area occupied, and to prevent damage from the weather and other construction activities and to maintain the quality of the material and minimizing damage to the environmental conditions in the areas.

#### 2. SCOPE

The stockpile and topsoil management plan shall be applicable for all construction site/area wherever the construction material and topsoil storage below table which depicts the key roles for the project and their specific environmental management responsibilities.

#### 3. TYPE OF STOCKPILES

Type of stockpiles depends on the nature and type of the material being stocked. Particular to this project, following are the types of stockpile:

##### A) In-situ material such as Top soil or other excavated material such as soil (sub-soil)

Stocks the topsoil resulted from site clearance or vegetation removal or any other project activity. The purpose is to store the topsoil and other excavated material so that it can later be used (up to the extent possible) in the construction activity at site itself i.e. Slope protection (turfing) and landscaping etc.

##### B) Borrow and quarry material

Licensed/ Govt. approved Borrow material and sand quarries shall be identified in the nearby vicinity of the project. Measures shall be taken to maintain a minimum distance of 500 m from any habitation. The sand, aggregates and other construction material shall be sourced from these authorized quarries after taking necessary permissions and will be transported to construction site where it will be temporarily stored in stockpiles specifically designed to store quarry material. Appropriate mitigation measures shall be adopted to minimize any impact on the environmental conditions in the surrounding areas.

##### C) Surplus serviceable material for disposal

Surplus serviceable material are the materials left after the construction is over at that particular site. The surplus material is temporarily stored in stockpiles at construction site. Efforts are made to use the same in construction activities up to the extent possible. However, the final left material like sand, aggregates etc. are managed through:

- Reinstating the borrow pits and other disturbed areas
- Transported to other construction site
- Returned back to vendors/ sold in market

##### D) Unserviceable material for disposal

Unserviceable materials are the waste material or materials which are of no use in the construction activities at site. These materials are stored temporarily in stockpiles, isolated from the other construction material to be used at site. Later, they are transported to a govt. approved landfill sites for final disposal or sold to authorized recyclers for further treatment and disposal.

#### 4. METHOD OF SOIL STACKING

Soil shall be stored in an area of the site where it can be left undisturbed and will not interfere with site operations. Ground to be used for storing the topsoil shall be cleared of vegetation and any waste arising from the development. Topsoil shall first be stripped from any land to be used for storing subsoil.

There are two principal methods for forming soil stockpiles, based on their soil moisture and consistency:

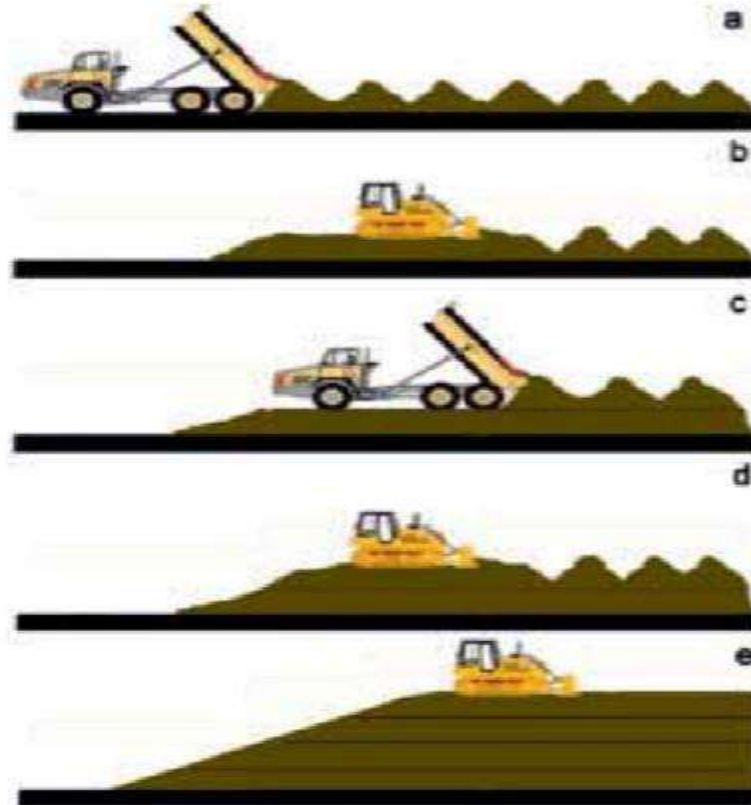
Method 1 should be applied to soil that is in a dry and non-plastic state. The aim is to create a large core of dry soil, and to restrict the amount of water that can get into the stockpile during the storage period. Dry soil that is stored in this manner can remain so for a period of years and it is reusable within days of respreading.

The soil is loose-tipped in heaps from a dump truck (a), starting at the furthest point in the storage area and working back toward the access point. When the entire storage area has been filled with heaps, a tracked

machine (excavator or dozer) levels them (b) and firms the surface in order for a second layer of heaps to be tipped. This sequence is repeated (c & d) until the stockpile reaches its planned height. To help shed rainwater and prevent ponding and infiltration a tracked machine compacts and re-grades the sides and top of the stockpile (e) to form a smooth gradient.

The soil is tipped in a line of heaps to form a 'windrow', starting at the furthest point in the storage area and working back toward the access point (a). Any additional windrows are spaced sufficiently apart to allow tracked plant to gain access between them so that the soil can be heaped up to a maximum height of 2m (b). To avoid compaction, no machinery, even tracked plant, traverses the windrow.

Once the soil has dried out and is non-plastic in consistency (this usually requires several weeks of dry and windy or warm weather), the windrows are combined to form larger stockpiles, using a tracked excavator (d). The surface of the stockpile is then regraded and compacted (e) by a tracked machine (dozer or excavator) to reduce rainwater infiltration.



## 5. LOCATION & QUANTITY OF STOCKPILE

Contractor shall ensure that:

- The stockpiles are areas shall be established within the ROW and more than 500 m away from any inhabitation or water bodies.
- If outside ROW, it will be ensured that these are 500 m away from the inhabitation and the owner of the land is willing to sell or lease.
- No stockpiles are established nearby any surface water bodies, natural drainage structures and water logging areas
- A minimum distance of 3.5 m shall be provided at stockpile area in-order to allow access in case of any emergency.
- Details of all existing stockpiles shall be submitted to the Engineer and same shall be updated periodically as per the construction progress and update the list at least quarterly.
- No significant impact on sensitive receptors such as significant adverse impact on flora & fauna, heritage, and aesthetic effect.
- Contractor will finalize the locations for Stockpile and Top soil storage, will be communicated to the Engineer/ Employer (Quantity and locations) in the below table format -



**Table Top soil removal, storage and utilization**

SN	Location where top soil removed	Location where top soil storage	Quantity of Topsoil to be stacked	Utilization of top soil	Remarks

**6. SITE CONDITION FOR STOCKPILE AREAS**

Site conditions play an important role in designing a stockpile and its stabilization. contractor shall adopt all measures to stabilize the surface of the stockpiles with surface roughening, erosion control Blankets, based on the requirement and site conditions.

Contractor shall consider following aspects while selecting a site for stockpile areas:

- Relevant sub-surface geology and geotechnical characteristics
- Structure of the base and sub-base including ability to protect groundwater and susceptibility to dissolution from rainwater or materials held in the stockpile
- Topography of the land and climatic conditions

Contractor shall also ensure that:

- No stockpile shall be located near any surface water body
- The location of stockpile shall not obstruct any natural drainage system
- All stockpiles are located at a minimum distance of 500 m from nearest habitation.

**7. LEGISLATIVE AND REGULATORY REQUIREMENT**

Contractor shall comply with all applicable regulations required for establishment and operation of stockpile areas. Contractor shall take all necessary applicable clearances from concerned authorities required under regulatory provisions. Contractor shall comply with legislative and regulatory requirement as applicable.

Contractor shall:

- check the implementation of mitigation measures and the practices being done at site
- Regular inspection of Stockpile areas.
- Comply and incorporate the comments and observation made by the engineer.
- Make necessary arrangements with Landowner if stockpiling is required to be done outside ROW.

**8. ENVIRONMENT MITIGATION MEASURES FOR STOCKPILE AREAS**

Contractor shall ensure that no environmental hazards occur due to stockpiles operation. All stockpiles shall be managed to prevent any negative impact of stockpile areas on environmental attributes.

- Contractor shall consider all designing measures before selecting an area for stockpiling to avoid any designing error.
- Site inspection and suitability will be ensured by Contractor
- Stockpile area shall be located within ROW and at a distance of 500 m from any inhabitation and if outside ROW, it will be ensured to keep a minimum distance of 500 m from any inhabitation and prior permission will be taken from the land owner.
- No stockpile area shall be located nearby any natural drainage structures and water bodies,
- The slope of the stockpile shall not exceed 1:2 and height shall not exceed 2 m.
- A minimum distance of 3.5 m shall be provided at stockpile area in-order to allow access incase of any emergency. Same has been mentioned in the referred section.
- Depending on the size and composition of the stockpile, flammable or combustible liquids and hazardous wastes shall not be stored near to waste stockpiles.
- Maintenance and other activities that can produce sparks such as welding should be conducted away from waste storage areas.

- No vehicles are allowed to enter the stockpile area and no objects are stored in stockpile area to prevent soil compaction.
- Topsoil is stored separately in a stockpile and shall be used in the project up to the maximum possible extent.

Table Environmental management plan for stockpile area management

S.No	Activities	Potential Environmental Impacts	Mitigation measures proposed
1	Site preparation or Site clearance	<ul style="list-style-type: none"> <li>• Significant degradation in air quality due to cutting of trees &amp; vegetation clearance</li> <li>• Impact on nearby habitation in terms of noise pollution, air pollution etc.</li> <li>• Loss of agriculture or fertile land</li> <li>• Degradation of water quality of nearby resources</li> </ul>	<ul style="list-style-type: none"> <li>• No agriculture land shall be used for stockpiling to extent possible.</li> <li>• Identify barren land within ROW</li> <li>• Locate at minimum 500 m away from habitation</li> <li>• Site with vegetation cover and tree cover shall be avoided</li> <li>• No stockpile location nearby by any water body and cross drainage structures</li> </ul>
2	Stockpiling construction material at site	<ul style="list-style-type: none"> <li>• Degradation in ambient air quality due to increase in PM10 and PM2.5 level</li> </ul>	<ul style="list-style-type: none"> <li>• Locate stockpile away from drainage lines to where they are protected from winds</li> <li>• Minimize number and size of stockpiles, if possible</li> </ul>
		<ul style="list-style-type: none"> <li>• Degradation of soil quality/fertility due to soil erosion</li> <li>• degradation in water quality due to sediment deposition in nearby water bodies</li> <li>• loss to plants and vegetation due to deposition of dust</li> <li>• contamination of soil due to oil spillage which may further result in ground water contamination, if not controlled within time</li> <li>• Degradation of water quality due to siltation and sedimentation</li> <li>• Water logging or flooding</li> <li>• Degradation in soil quality due to run-off</li> <li>• Choking of existing natural drainage structures in the area.</li> <li>• Unsafe access during emergency</li> </ul>	<ul style="list-style-type: none"> <li>• Stabilize stockpiles that will remain bare for more than 28 days by covering with mulch or anchored fabrics or seeding with sterile grass</li> <li>• Dust suppression whenever required</li> <li>• Covering of stockpiles if and when required</li> <li>• The contaminated material will be removed and shall be handled as per Hazardous/solid waste management plan</li> <li>• Keep topsoil separate from under burden while stockpiling</li> <li>• Construct the stockpiles with no slope greater than 2:1 (horizontal to vertical). A lesser slope may be provided where erosion risk is high</li> <li>• Establish sediment control measures like silt fencing etc. around unsterilized stockpiles</li> <li>• Covering of stockpiles during rainy season</li> <li>• A minimum distance of 3.5 m shall be provided at stockpile area in-order to allow access in case of any emergency. Same has been mentioned in the referred section</li> </ul>

## 9. TOPSOIL MANAGEMENT PLAN

Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. It is rich in organic-matter, has friable consistence, water-holding capacity, and nutrient content and is a better growth medium.

- Topsoil will be removed from all areas where physical disturbance of the surface (excavation, filling or compaction by equipment) will occur and shall be stored and adequately protected. Topsoil from the areas that will be used for storing topsoil or subsoil should not be stripped / removed. Topsoil will be stripped and stockpiled for later re-use.
- Topsoil will be stored in stockpiles not more than 2m high with slopes not over 45° and should be drained with open ditches.

- Soils contaminated by hazardous substances will be disposed of at an approved waste disposal site.
- The topsoil stockpiles will be stored, shaped and sited in such a way that they do not interfere with the flow of natural drainage of water to cause ponding or erosion, or itself be eroded by the action of water.
- We will ensure that no topsoil is lost due to erosion – either by wind or water. Areas to be top-soiled and grassed shall be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns.
- Excavated topsoil will be used for landscaping or embankment development or for rehabilitation of the land where this excavated topsoil will be used for the final top cover required for vegetation.
- Topsoil should be retained on site in order to be used for site rehabilitation.
- Wherever possible, stripped topsoil should be placed directly onto an area being rehabilitated. This avoids stockpiling and double handling of the soil. Topsoil placed directly onto rehabilitation areas contains viable seed, nutrients and microbes that allow it to revegetate more rapidly than topsoil that has been in stockpile for long periods.
- If direct transfer is not possible, the topsoil should be stored separately from other soil heaps. The soil should not be stored for a long time and should be used as soon as possible. The longer the topsoil is stored, the more seeds, microorganisms and soil biota are killed.
- If topsoil is stored on a slope then sediment fencing should be used downslope of the stockpile in order to intercept any sediment and runoff should be directed away from the stockpiles upslope.

#### 10. ENVIRONMENT MONITORING PLAN FOR STOCKPILE AREA

Contractor shall manage and monitor the effects on environmental quality as per the approved Environment monitoring plan. Following practices shall be adopted to monitor the Environmental condition at Stockpile areas:

- Visual Inspection of dust emissions
- Impact on water quality and natural drainage structures, if any
- Water pollution, if any
- Monitoring records of topsoil stocks and location
- Weekly inspection by the EM and submission it to SEM along with site photographs for review.
- Regular monitoring by Site Engineer or Section Manager.
- monitoring the environmental parameters (air, water, soil, noise) and quality at construction site as per the approved Environmental Monitoring Plan
- monitoring indicators of routine inspection and observation as per the checklist given below:

#### 11. RECORDS, INSPECTION AND REPORTING

EM shall conduct monthly inspection of all stockpile area in order to:

- Monitor the effectiveness of the control measures and to ensure the environmental impacts are being minimized.
- Ensure the requirements and inspection frequencies are being met.
- Top soil storage and their utilization to be recorded and maintained.

EM shall monitor the management activity and keep the records of monitoring and routine inspection. It shall be ensured that:

- A register or similar records/routine checklist documents and records of all types and quantities of material incoming and outgoing as well as where re-use or recycled materials are being used and
- Inspections records are kept

Routine monthly inspection shall be done as per the checklist which will reflect location of each stockpile's, material being stockpiled, surrounding environment and any specific issues associated with it.

- Any issues that are observed during inspection shall be conveyed to Chief SHE Officer and corrective measures shall be taken.
- EM shall send the monthly report to SEM, who will review the inspection report and forward the

same to Chief SHE Officer.

- Any suggestions, observations made by the engineer shall be addressed, if found necessary and shall submit the updated report.

**12. TRAINING**

Training shall be provided to site Engineers and other supervisors at site for effective management and operation of Stockpile areas. Training module shall be developed by SEM in coordination from EM. EM at site shall deliver the training to the Engineer and workmen at site. The topics to be covered in training shall include:

- Location criteria for site selection
- Identification of Environmental Sensitive issues.
- Type of Stockpiles
- Slope protection and Specification of Stockpiles
- Management of Stockpiles
- Inspection and monitoring

**13. REVIEW**

SEM shall review the Stockpile and topsoil Management Plan, if and when required. All regulatory and applicable guidelines shall be followed and required clearances shall be obtained.

He shall ensure that:

- If any non-compliance to the management plan is observed, Contractor shall review the same and shall take corrective measures to comply the same.
- Any observations made by the engineers shall be reviewed and shall be complied, if required.

**14. DECOMMISSIONING OF STOCKPILE AREA**

Decommissioning of stockpile sites shall be done after its use and when it is no longer required or when construction is over. Contractor shall reinstate the stockpile area to near its natural conditions. Decommissioning shall involve following activities:

- Using the entire material in construction activity which was stockpiled
- Clearing all stockpile material from the site and recycling and disposing it at a licensed landfill facility
- levelling the site to its original slope and planting or landscaping to prevent soil erosion
- undertaking post operation inspection to check the site condition

**15. GRIEVANCE REDRESSAL MECHANISM**

Complaint associated with compulsory acquisition of land and property will be brought to notice to PWD and with mutual consultation with all parties involved, the issue will be amicably resolved through PWD.

Grievances/complaints on environmental matters are expected to be relatively few and straight forward so a simplified procedure will be followed. Local concerns which may arise as a result of inappropriate implementation stockpile and top soil storage, the main aim of which is the reduction of adverse impacts to acceptable levels. These issues will be best addressed through open dialogue and a responsive approach, with acknowledgement of errors wherever appropriate, followed by rapid remedial action

Any public complain and grievance with respect to generation of pollutants, inappropriate and inadequate pollution control measures, use of public resources such as water resource will be seriously dealt with. Once such notice and verbal/written complain notice, it will be brought to Project EHS committee and based on the severity of the complaint, it will be dealt with appropriate resolution and action plan. All such complains/grievances will be recorded along with the close out reports.

**Table Checklist for Routine Monthly inspection of Stockpile areas**

SL. NO.	POINTS	OBSERVATION	REMARKS
	Specification		
1.	Is the slope of stockpile exceeding or greater than 1:2 (vertical: Horizontal)		
2.	Is the height of stockpile exceeding than 2 m		
3.	Is multiple stockpiles established to maintain slope?		

SL. NO.	POINTS	OBSERVATION	REMARKS
	Water quality		
1.	Is any sedimentation run-off being generated from the site?		
2.	Is silt fencing provided to control sediment and soil erosion?		
3.	Is there any waterlogging around the stockpile?		
4.	Is the stockpile area prone to flooding?		
5.	Is there any discharge of run-off into nearby drains?		
	Air Quality		
1.	Is there any dust emission?		
2.	Is dust suppression measures adopted at site?		
3.	Is water sprinkling being done at access roads?		
4.	Is covering provided during high wind flow?		
5.	Is there any deposition of dust on nearby vegetation/crop?		
	Soil Quality		
1.	Is there any soil erosion?		
2.	Is topsoil being stored in a separate stockpile?		
3.	Is there any oil spillage at stockpile area?		
4.	Is there any drainage issue at stockpile area?		
5.	Is there is generation of pest or other microbes at stockpile area?		
	Waste Generation		
1	Is any surplus material left after use of stockpile If Yes, Plan for Reuse/Disposal/any other use		
	Awareness		
1.	Is training for environmental awareness provided as per training program?		
	Any other observations		
	Photographs of site		

**Table Checklist for inspection of Stockpile areas for selection**

SL. NO.	POINTS	OBSERVATION	MEASURES/ REMARKS
	Location and site condition		
1.	Is it located on agriculture/fertile/grazing land?		
2.	Is it located outside ROW		
3.	Is it located within 500 m from nearby habitation?		
4.	Is it located nearby any water courses/natural drains/water logging areas?		
5.	Is any vegetation clearance required including tree cutting?		
6.	Is there any environmental sensitive area located within immediate vicinity (if yes, give distance)		
7.	Community Consultation required? If Yes, is it taken place?		
	Access to sites		
1.	Is separate transportation route required to access the stockpile area?		
2.	Are the entry roads / walkways / passages kept clear?		
3.	Are the walkways & roads are even and free from water logging?		
4.	Is Illumination level OK in access / egress?		
5.	Is there any vegetation clearance required to access the stockpile area?		