

April. 2026

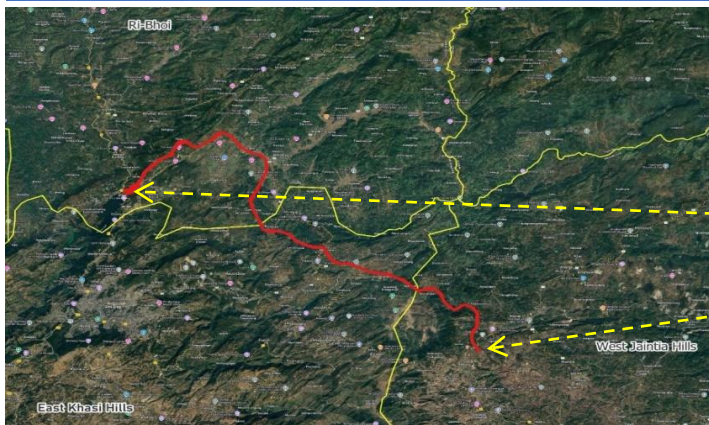
DETAILED PROJECT REPORT (DPR)

VOLUME-I
MAIN REPORT

DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS.

NHIDCL/BHARATMALA/DPR/PHASE1/LOT1/PKG 1A/PKG1B/2018

PACKAGE - 01
(MAWLYNGKHUNG – PANCHGRAM)
FROM KM 0+000 TO 45+645 KM
TOTAL DESIGN LENGTH= 45.645 KM



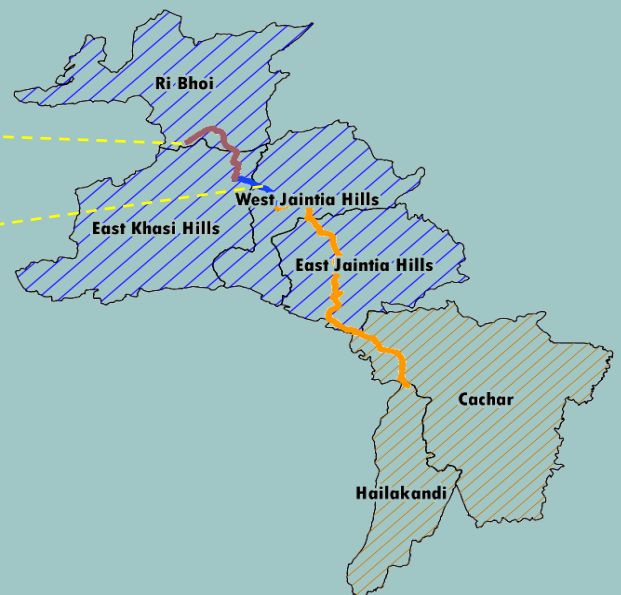
Consultants:



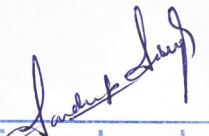
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Development Corporation Ltd.**
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Team Leader

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Appendixes

Sr. No.	Appendix	Content
1	Appendix-I	Improvement Proposal of Structures
2	Appendix-II	Horizontal & Vertical Alignment Report
3	Appendix-III	Pavement Design
4	Appendix-IV	Typical Cross Sections

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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CHAPTER-1 INTRODUCTION

1.1 Project Background

The National Highways & Infrastructure Development Corporation Limited (NHIDCL) has been entrusted with the assignment for providing Consultancy services for preparation of DPR for **Development, Maintenance, Management And Operation of Greenfield High-Speed Corridor From Mawlyngkhung (Near Shillong) in Meghalaya To Panchgram (Near Silchar) In Assam By 4-Laning With Paved Shoulders On Hybrid Annuity Basis under Public-Private Partnership (PPP) Mode** for greenfield alignment to Four lane with paved shoulder configuration. The Consultancy Services for this project has been awarded to Global Infra Solutions in JV with Krishna Techno Consultants Pvt. Ltd. in association with Infycons Creative Software Pvt. Ltd.

The Letter of commencement for this assignment was issued by General Manager (Technical), National Highway & Infrastructure Development Corporation Limited, New Delhi vide their letter No. NHIDCL/Bharatmala/DPR/Phase-I/Lot-1/Package 1B/2017/106 dated 02-07-2018.

The name of the Project Highway as per RFP are (1) Dudhnoi-Damra (5 km), (2) Damra-Nengkra (66 km), (3) Nengkra-Williamnagar (16 km), (4) Mawlyngkhung-Mawryngkneng (49 km), (5) Jowai-Ratachera (101 km), (6) Ratachera-Kalain (25 km), (7) Kalain-Panchgram (16 km), (8) Mawryngkneng-West Jaintia Hills (19 km) and (9) West Jaintia Hills- Jowai (7 km) in the states of Assam and Meghalaya. The total length of the project highway is 304 km.

The Alignment has been changed into following since the commencement:

1. Dudhnoi-Damra-Dainadubi (8.60Km.) with ref. Letter BO/SHG/P/BHM/GEN/1201 issued on 28.01.2019 extending the stretch to Dainadubi (PMU Bongaigaon, RO office).
2. Dainadubi-Darugiri (44.4Km.) (PMU Tura, RO office)
3. NH-127B Darugiri-Songsak-Rongrengiri (William Nagar Junction;39.06Km.) with ref. No. NHIDCL/RO-SHG/D-W/507/2021/821, dated 15.07.2021(PMU Tura, RO office).
4. Mawlyngkhung-Mawryngkneng (49 km) (PMU Mawkyrwat, RO office)
5. Mawryngkneng-West Jaintia Hills (19 km) (PMU Mawkyrwat, RO office)
6. West Jaintia Hills-Jowai (7 km) (PMU Mawkyrwat, RO office)
7. Jowai-Ratachera (101 km) (PMU Mawkyrwat, RO office)
8. Ratachera-Kalain (25 km) (PMU Silchar, RO office)
9. Kalain-Panchgram (16 km) (PMU Silchar, RO office).

An index Map of the project corridor of **Mawlyngkhung – Mawryngkneng - West Jaintia - Jowai Bypass – Ratachera (Malidar-Bridge) - Kalain - Panchgram** is shown in **Figure 1.1 Index Map**.

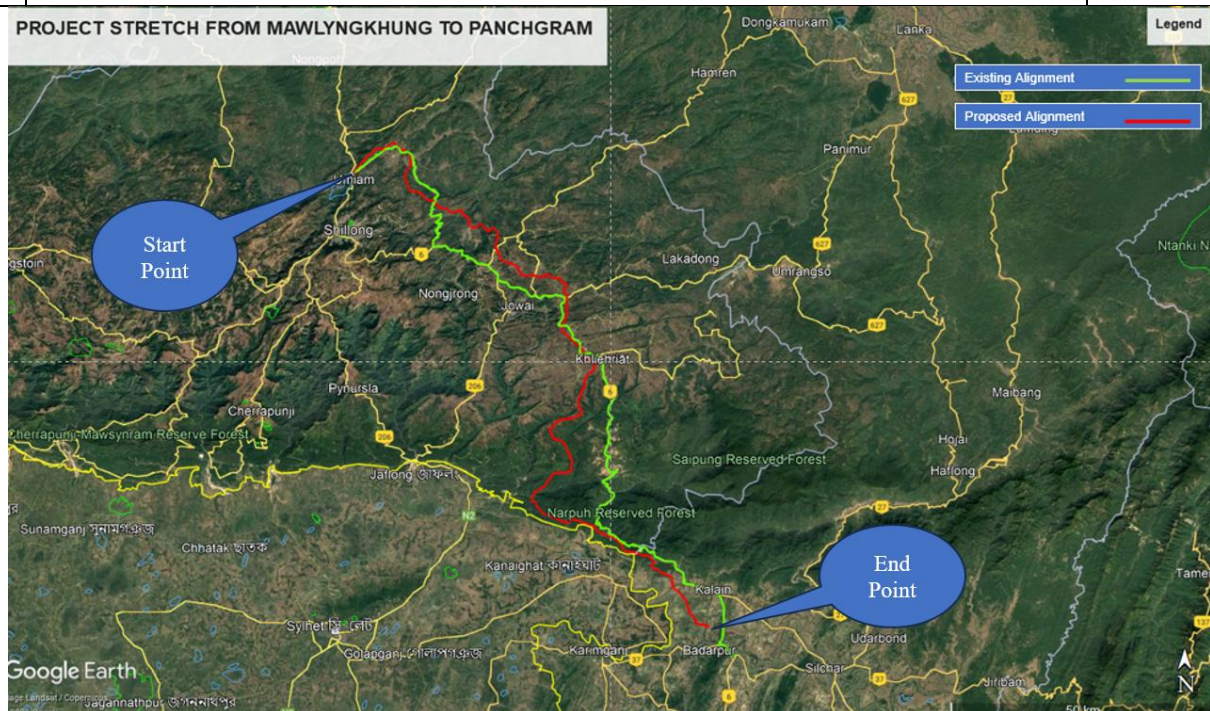


Figure 1.1: Project Stretch (a & b)

1.2 Project Brief and Project Roads

The name of the project highway is **Development, Maintenance, Management and Operation of Greenfield High-Speed Corridor from Mawlyngkhung (Near Shillong) In Meghalaya to Panchgram (Near Silchar) In Assam by 4-Laning with Paved Shoulders. (Package-01, KM 0.000 near Pyllun village, Ri-Bhoi district to KM 45.645 near Wahiajer village, West Jaintia Hills District in State of Meghalaya; Design length-45.645KM) on Hybrid Annuity Mode**. For the convenience of tendering and execution, project road has been split in 4 packages.

Table 1.1: List of Roads in Package's wise

S. No.	From (Km)	To (Km)	Length (Km)	Package's	District
1.	0.000	18.830	18.830	Pkg-1	Ri-Bhoi
2.	18.830	20.425	1.595		East Khasi Hills
3.	20.425	21.635	1.210		Ri-Bhoi
4.	21.635	35.140	13.505		East Khasi Hills
5.	35.140	45.645	10.505		West Jaintia Hills
6.	45.645	66.340	20.695	Pkg-2	West Jaintia Hills
7.	66.340	78.600	12.260	Pkg-3	East Jaintia Hills
8.	78.600	133.320	54.720		East Jaintia Hills
9.	133.320	141.800	8.480	Pkg-4	East Jaintia Hills
10.	141.800	164.355	22.555		Cachar
		Total	164.355		

The Major villages along the project road are Pyllun, Sumer Umbang, Lumsohpetbneng, Mawpun Kshaid, Umeit, Umdohbyrthih, Umroi Madan, Umroi Labansaro, Syllei-U-Lar, Umsawriang, Umktieh, Nongrah, Lumdaitkhla, Nonglakhait, Umsarang, Lumsohphoh, Wahmyntait, Mawsiatkhnem, Lumkseh, Lumdiengsai, Mawpdang (Mawkhanu), Diengpasoh

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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(Jaroid), Nonghali, Mawryngkneng (Mawiong Sung), Nongkhroh, Thadmusem, Sohphoh, Larnai, Kdohkule, Wahiajer.

The Project Road traverses through the **Ri Bhoi, East Khasi Hills & West Jaintia Hills** Districts in the State of Meghalaya.

The adopted configuration for the project highway is 4-Laning with paved shoulder”.

Note: - PKG-01 is a part of High-Speed Corridor (HSC) traversing through the state of Meghalaya. Entire HSC length has been divided into 4 PKGs for facilitating construction. Reports for each PKG length will be submitted separately.

Since the alignment is entirely greenfield, only proposals are presented in this report. Above mentioned details are shown only to give understanding of whole contract work issued in 2018. However, HSC or High-Speed Corridor is entirely taken up as new project work and will be presented in this report ahead.

Location is given in the **Table 1.2** below:

Table 1.2: Location of Proposed Project Road

Sr. No	Design Chainage		Design Length (km)	Design Road Coordinate's	
	From (km)	To (km)		Start	End
1	0+000	45+645	45.645	Latitude: 25°40'39.15"N & Longitude: 91°54'29.50"E	Latitude: 25°32'26.82"N & Longitude: 92°10'28.28"E
Total Length (km)			45.645		

Details of the existing features and improvement proposal considered are presented in this report.

1.3 Executive Summary

S. No	Features	Description/ Quantity	Remarks / Detailed Description
1	Project name & Package	Development, Maintenance, Management and Operation of Greenfield High-Speed Corridor from Mawlyngkhung (Near Shillong) in Meghalaya to Panchgram (Near Silchar) in Assam by 4-Laning with Paved Shoulders on Hybrid Annuity Basis. PKG-01, KM 0.00 near Pyllun village, Ri-Bhoi District to KM 45.645 near Wahiajer village, East Jaintia Hills District in State of Meghalaya; Design length-45.645 Km	
2	Road Name	PKG-01 High Speed Corridor (HSC)	
3	Project District	Ri-Bhoi, East Khasi Hills & West Jaintia Hills	
4	Project State	Meghalaya	
5	Start Point	Pyllun village	

		DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM					MAIN REPORT (DPR)			
S. No.	Features	Description/ Quantity					Remarks / Detailed Description			
6	End Point	Wahiajer village								
7	Proposed Length (km)	Design Length: 45.645 km								
9	Proposed carriageway	Proposed: 4-lane+Paved Shoulder Configuration								
10	Terrain	Mountainous and Hilly terrain (without snow)								
11	Built ups/Villages along the alignment.	Pyllun, Sumer umbang, Lumsohpetbneng, Mawpun Kshaid, Umeit, Umdohbyrthih, Umroi Madan, Umroi Laban saro, Syllei-U-Lar, Umsawriang, Umktieh, Nongrah, Lumdaitkhla, Nonglakhait, Umsarang, Lumsohphoh, Wahmyntait, Mawsiatkhnam, Lumkse, Lumdiengsai, Mawpdang (Mawkhanu), Diengpasoh (Jaroit), Nonghali, Mawryngkneng (Mawiong Sung), Nongkhroh, Thadmusem, Sohphoh, Larnai, Kdohkule, Wahiajer.								
Traffic 2023										
12	Sr. No.	Description	Total PCUs in 2023							
	1	High Speed Corridor (HSC)	17,800							
13	Design Period	20 years for Flexible pavement	As per the traffic projection, it is assumed that DPR preparation year 2025-26, Considering three years of construction period (2027-2029), i.e., opening of road in 2030, design period is taken up to 2049 (2030–2049, 20 years).							
For All Traffic Details – Refer Chapter 5										
14	Recommended Traffic Lane:	Road	Lane Requirement	Lane Proposed						
		HSC	4-Lane+PS	4-Lane+PS						
Expected Traffic projection to proposed for year 2049 (After 20 Years)										
	HSC	As per the Diverted traffic and growth rate of 5%	Refer Chapter 5 Traffic Analysis							
15	MSA & Proposed Crust Thickness									
		Section	Design Period (Years)	Adopted MSA	CBR (%)	Pavement Crust Compositions				
		Main C/w (HSC)	20	110	minimum sub grade CBR of 8% and maximum subgrade CBR of 10%.	BC (mm)	DBM (mm)	WMM (mm)	CTSB (mm)	Total (mm)
					As per Technical Schedule					



S. No.	Features	Description/ Quantity					Remarks / Detailed Description																																									
		Ramps/ Approach Roads	20	50	minimum sub grade CBR of 8% and maximum subgrade CBR of 10%.	As per Technical Schedule																																										
Proposed Structures and Facilities																																																
16	Viaduct	For Main Carriageway <table><thead><tr><th>S. No.</th><th>Type of Structure</th><th>New Proposed</th></tr></thead><tbody><tr><td>1</td><td>Major Bridge/ Major Bridge Cum Viaduct</td><td>4</td></tr><tr><td>2</td><td>Minor Bridge</td><td>12</td></tr><tr><td>3</td><td>Viaduct</td><td>27</td></tr><tr><td>4</td><td>Box Culvert</td><td>111 (109 New Proposed, 2 Reconstruction)</td></tr><tr><td>5</td><td>VOP</td><td>13</td></tr><tr><td>6</td><td>VUP</td><td>5</td></tr><tr><td>7</td><td>VUP cum Viaduct</td><td>1</td></tr><tr><td>8</td><td>LVUP</td><td>2</td></tr><tr><td>9</td><td>SVUP</td><td>11</td></tr><tr><td>10</td><td>Utility underpass</td><td>5</td></tr><tr><td>11</td><td>Overpass</td><td>4</td></tr><tr><td>12</td><td>Underpass</td><td>0</td></tr><tr><td colspan="2">Total</td><td>195</td></tr></tbody></table>					S. No.	Type of Structure	New Proposed	1	Major Bridge/ Major Bridge Cum Viaduct	4	2	Minor Bridge	12	3	Viaduct	27	4	Box Culvert	111 (109 New Proposed, 2 Reconstruction)	5	VOP	13	6	VUP	5	7	VUP cum Viaduct	1	8	LVUP	2	9	SVUP	11	10	Utility underpass	5	11	Overpass	4	12	Underpass	0	Total		195
S. No.	Type of Structure						New Proposed																																									
1	Major Bridge/ Major Bridge Cum Viaduct						4																																									
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7	VUP cum Viaduct						1																																									
8	LVUP						2																																									
9	SVUP						11																																									
10	Utility underpass						5																																									
11	Overpass						4																																									
12	Underpass	0																																														
Total		195																																														
17	Major Bridges																																															
18	Minor Bridges																																															
19	Culverts																																															
20	VOP																																															
21	VUP/LVUP/SVUP																																															
22	Utility underpass (IGGL)																																															
23	Overpass																																															
24	Underpass																																															
25	ROB	For Interchanges/Existing Cross Roads <table><thead><tr><th>S. No.</th><th>Type of Structure</th><th>New Proposed</th></tr></thead><tbody><tr><td>1</td><td>Major Bridge</td><td>0</td></tr><tr><td>2</td><td>Minor Bridge</td><td>2</td></tr><tr><td>3</td><td>Viaduct</td><td>15</td></tr><tr><td>4</td><td>Box Culvert</td><td>42</td></tr><tr><td>5</td><td>VOP</td><td>4</td></tr></tbody></table>					S. No.	Type of Structure	New Proposed	1	Major Bridge	0	2	Minor Bridge	2	3	Viaduct	15	4	Box Culvert	42	5	VOP	4																								
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		DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM				MAIN REPORT (DPR)	
S. No	Features	Description/ Quantity				Remarks / Detailed Description	
			6	VUP	0		
			7	LVUP	0		
			8	SVUP	0		
			9	Utility underpass	0		
			10	Overpass	0		
			11	Underpass	0		
			Total		63		
		26	Interchanges/ Access points (Major/Minor)	04 nos. (Note: - Direct Access to NH is not allowed. Access points have been proposed on High-speed corridor.)			
27	Toll Plaza	As per Closed tolling on Relevant Access Points only.					
28	Thrie-Beam Crash Barrier	As per Technical Schedules					
29	RCC Drain	49,773 m. (For Main Carriageway) & 27,474 m (For Interchanges)					
Protection Works							
30	Retaining Wall	7940 m (For Main Carriageway) & 200 m (For Interchanges)					
31	Breast wall (of appropriate type)	44,345 m (For Main Carriageway) & 20,400 m (For Interchanges)					
32	Stone Pitching	14,425 m (For Main Carriageway)					
33	RCC Toe Wall	11,053 m (For Main Carriageway)					
Land Acquisition							
34	Land details summary:						
	Total Land required in Ha.	452.24					
Cost Estimate							
35	Project Civil Cost-As per RFP						

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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1.4 Objectives of the Project

The main objective of the project is to establish technical feasibility of the project alignment while analysing the traffic, need, economic benefits and then prepare all relative documents for arriving at final length, cost summary of various works with detailed drawings and diagrams for any proposal summary. The objectives of the project are decided not only in terms of connectivity but also in terms of expenditures required for completing the project construction, benefits to society/economy derived on basis of economic evaluation, firmness of the proposals with respect to financial aspects etc.

Package-1B Alignment comprises of straight road (from/along NH-06) from Umiam Lake to Panchgram/Badarpur Ghat (Assam). Therefore, objective of the entire road (considering as a whole single alignment) is discussed here with:

All the objectives of the project are summarized below: -

The main objective of the project is to establish technical feasibility of the project alignment while analysing the traffic, need, economic benefits and then prepare all relative documents for arriving at final length, cost summary of various works with detailed drawings and diagrams for any proposal summary. The objectives of the project are decided not only in terms of connectivity but also in terms of expenditures required for completing the project construction, benefits to society/economy derived on basis of economic evaluation, firmness of the proposals with respect to financial aspects etc.

All the objectives of the project are summarized below: -

- A. This road stretch is a vital Economic corridor & lifeline for state of Meghalaya, Mizoram, Tripura, Manipur & the Barak valley of Assam as it provides the shortest connectivity from regional commercial centre (Guwahati) and rest of India.
- B. The road also plays vital role in vigilance of international border along Bangladesh.
- C. Possibilities for economic development of surrounding villages/towns and generate employment (direct and indirect) opportunities of villages/towns in Ri Bhoi, East Khasi Hills, West Jaintia Hills, East Jaintia Hills districts of Meghalaya & Cachar District of Assam directly and other districts indirectly.
- D. Connectivity to 9 major coalfields and many cement factories in EKH district.
- E. To provide better access to markets and industrial locations ultimately providing improvements in living standards.

On completion and/ or during progress of the proposed services, the NHIDCL will be able to:

- Upgrade/ reconstruct/ widen as well rehabilitate selected roads;
- Carry out road safety enhancement work;
- Do planning, budgeting and program to strengthen the project highway, asset and financial management;

1.5 Scope of Services

The services will be undertaken in different parts and is broadly as below;

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Part A: The Consultant shall study the possible locations and design of toll plaza (if any). Wayside amenities required on tolled highway shall also be planned.

Part B: All ready to implement “good for construction” drawings shall be prepared.

Part C: Environmental Impact Assessment and Environmental Management Plan shall be carried out by the Consultant meeting the requirements of the Government of India

Part D: The consultant shall also suggest alternate traffic movement plan during construction.

1.6 Organization of Detailed Project Report

Reports

(i) Volume - I, Main Report: This report will present the project background, social analysis of the project, details of surveys and Investigations carried out, analysis and Interpretation of survey and investigation data, traffic studies and demand forecasts designs, cost estimation, environmental aspects, economic and commercial analyses and conclusions. The report shall include Executive Summary giving brief accounts of the findings of the study and recommendations.

The Report shall also include maps, charts and diagrams showing locations and details of existing features and the essential features of Improvement and upgrading. The Environmental Impact Assessment (EIA) Report for contract package shall be submitted as a part of the main report.

The basic data obtained from the field studies and investigations and input data used for the preliminary design shall be submitted in a separate volume as an Appendix to Main Report.

(ii) Volume-II, Design Report: This volume shall contain design calculations, supported by computer printout of calculations wherever applicable. The Report shall clearly bring out the various features of design standards adopted for the study. The design report will be in two parts. Part-I shall primarily deal with the design of road features and pavement composition while Part-II shall deal with the design of bridges, tunnels and cross-drainage structures. The sub-soil exploration report including the complete details of boring done, analyses and Interpretation of data and the selection of design parameters shall be included as an Appendix to the Design Report.

The detailed design for all features should be carried out as per the requirements of the Design Standards for the project. However, there may be situations wherein it has not been possible to strictly adhere to the design standards due to the existing site conditions, restrictions and other considerations. The report should clearly bring out the details of these aspect and the standards adopted.

(iii) Volume III, Material Report: The Materials Report shall contain details concerning the proposed borrow areas and quarries for construction materials and possible sources of water for construction purposes. The report shall include details on locations of borrow areas and quarries shown on maps and charts and also the estimated quantities with mass haul diagram including possible end use with leads

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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involved, the details of sampling and testing carried out and results in the form of important Index values with possible end use thereof.

The materials Report shall also include details of sampling, testing and test results obtained in respect physical properties of subgrade soils. The information shall be presented in tabular as well as in graphical representations and schematic diagrams. The Report shall present soil profiles along the alignment.

The material Report should also clearly indicate the locations of areas with problematic soils Recommendations concerning the improvement of such for use in the proposed construction works, such as stabilization (cement, lime, mechanical) should be Included in the Report.

(iv) Volume IV, Environmental Assessment Report Including Environmental Management Plan (EMP) & Resettlement Action Plan (RAP): The Report shall be prepared conforming to the Guidelines of the Government of India, State Government and World Bank/ADB as appropriate for construction package.

(v) Volume-V, Technical Specifications: The MORT&H's Technical Specifications for Road and Bridge works shall be followed for this study However, Volume IV: Technical Specifications shall contain the special technical specifications which are not covered by MOST Specifications for Roads and Bridges (latest edition/revision) and also specific quality control norms for the construction of works.

(vi) Volume-VI, Rate Analysis: This volume will present the analysis of rates for all items of works. The details of unit rate of materials at source, carriage charges, any other applicable charges, labour rates, machine charges as considered in arriving at unit rates will be included in this volume.

(vii) Volume VII, Cost Estimates: This volume will present the contract package wise cost of each item of work as well as a summary of total cost.

(viii) Volume VIII, Bill of Quantities: This volume shall contain the package-wise detailed Bill of Quantities for all items of works.

(ix) Volume IX, Drawing Volume: All drawings forming part of this volume shall be 'good for construction' drawings. All plan and profile drawings will be prepared in scale 1:250V and 1:2500H scale to cover one km in one sheet. In addition, this volume will contain 'good for construction' drawings for the following:

- Horizontal Alignment and Longitudinal Profile.
- Detailed Working Drawings for Individual Culverts and Cross Drainage Structures.
- Detailed Working Drawings for Individual Bridges, tunnels and Structures.
- Detailed Drawings for Improvement of At-Grade and Separated.
- Intersections and Interchanges.

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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- Drawings for Road Sign, Markings, Toll Plazas, and other Facilities.
- Schematic Diagrams (linear chart) Indicating but be not limited to be following:
- Widening scheme;
- Locations of median openings, intersections, interchanges, underpasses, overpasses, bypasses;
- Locations of service roads:
- Location of traffic signals, traffic signs, road markings, safety features; and,
- Locations of toll plaza, parking areas, weighing stations, bus bays, rest areas, if any.
- Drawings for toll plaza, Bus Bays, Parking areas, Rest areas, weighing stations etc. All drawings will be prepared in different sheets. The format for plan, cross section and profile drawings shall be finalized in consultation with the concerned -NHIDCL officers. The drawings shall also include details of all BM and reference pillars, HIP and VIP. The co-ordinates of all points should be referenced to a common datum, preferably GTS referencing system. The drawings shall also include the locations of all traffic safety features including traffic signals, signs, markings, crash barriers, delineators and rest areas, busbays, parking areas etc.
- Digital drawings of proposed highway and features

1.7 Alignment Approvals

The alignment was in-principally approved by the Competent Authority vide NHIDCL HQ letter dated 21.07.2023.

CHAPTER-2 PROJECT ROADS DESCRIPTION

2.0 Introduction

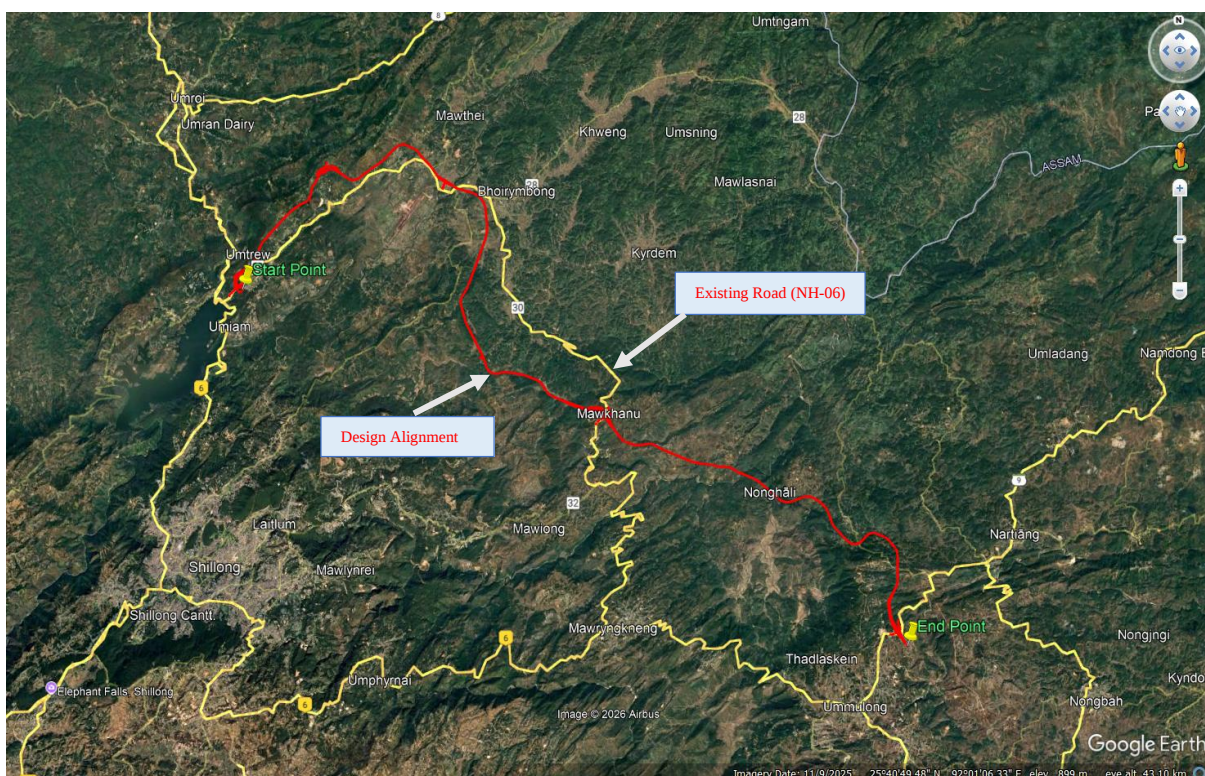
This chapter deals with the existing features of project road, topographic details, site features, important structures, junctions, pavement characteristics and road safety requirements etc.

The name of the project highway is PACKAGE-01 From Km. 0/000 in near Pyllun village in Ri Bhoi District and end at km 45/645 in near Wahiajer village in West Jaintia Hills District of Meghalaya. The total design length of stretch is 45.645 km.

2.1 Project Location

The Pkg-01, Km 0.000 near Ri Bhoi village (Latitude: 25°40'39.54"N & Longitude: 91°54'17.89"E, Ri Bhoi District to Km 45.645 near Wahiajer village (Latitude: 25°32'26.82"N & Longitude: 92°10'28.28"E, West Jaintia Hills District in State of Meghalaya. Design length – 45.645 Km.

Figure 2.1: Existing Highway (NH-06) & Proposed Greenfield Alignment Stretch of Pkg-1



The Project Road traverses through the **Ri-Bhoi, East Khasi Hills & West Jaintia Hills** Districts in the State of Meghalaya.

2.2 Carriageway

No existing features observed.

2.3 Terrain

The project highway passes entirely through Hilly/Mountainous terrain.

Figure 2.2: Photographs of Terrain



2.4 Land Use

The land use pattern along the project highway comprises mostly dense vegetation whereas agricultural, barren land and forest types of land are intermittent. The details are as given in the table below. Ribbon development along settlements has been observed at many locations on project road.

Table 2.1 (a): Land Use Details

Sr. No.	Land Use	Length (Km)	Percentage (%)
1	Agricultural Land	28.175	61.73%
2	Barren Land	16.230	35.56%
3	Forest	1.240	2.72%
	Total	45.645	100.00%

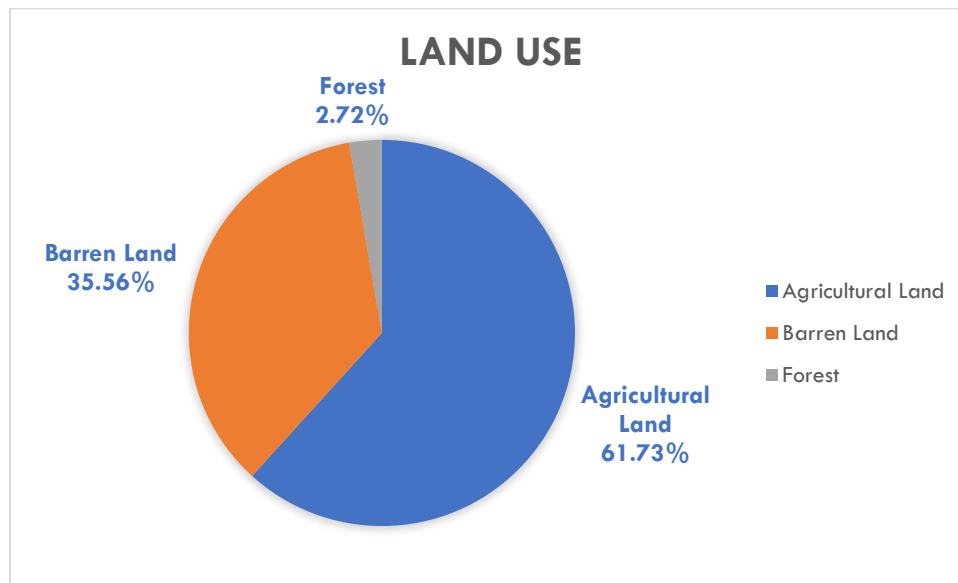


Figure 2.2 (a): Photograph of Land Use



Table 2.2: List of Villages

District	Name of Village	Chainages (Km)		Length (Km)
		From	To	
Ri-Bhoi	Sumer umbang	0+000	1+370	1.370
	Pyllun	1+370	3+730	2.360
	Lumsohpetbneng	3+730	6+075 (LHS)	2.345
	Mawpun Kshaid	5+020 (RHS)	5+280 (RHS)	0.260

District	Name of Village	Chainages (Km)		Length (Km)
		From	To	
	Umeit	5+200 (LHS)	7+270	2.070
	Umdohbyrthih	7+270	9+230	1.960
	Umroi Madan	9+230	9+620	0.390
	Umroi Laban saro	9+620	10+960	1.340
	Syllei-U-Lar	10+830 (LHS)	10+958 (LHS)	0.128
	Umsawriang	11+200 (LHS)	11+250 (LHS)	0.050
	Umkatieh	11+768 (LHS)	11+943 (LHS)	0.175
	Nongrah	10+960	13+080	2.120
	Lumdaitkhla	13+080	15+450 (LHS)	2.370
	Nonglakhait	15+400	17+039	1.639
	Umsarang	17+039	18+360	1.321
	Lumsohphoh	18+360	18+936	0.576
	Wahmyntait	20+555	21+770	1.215
	Mawsiatkhnem	18+830	20+600	1.770
East Khasi Hills -	Lumkseh	21+770	23+680	1.910
	Lumdiengsai	23+680	24+683	1.003
	Mawpdang (Mawkhanu)	24+683	28+192	3.509
	Diengpasoh (Jarait)	28+192	32+070	3.878
	Nonghali	32+070	33+431	1.361
	Mawryngkneng (Mawiong Sung)	33+431	35+213	1.782
West Jaintia Hills	Nongkhroh	35+213	37+155	1.942
	Thadmusem	37+155	39+635	2.480
	Sohphoh	39+635	42+400 (RHS)	2.765

District	Name of Village	Chainages (Km)		Length (Km)
		From	To	
	Larnai	42+400 (RHS)	42+900 (RHS)	0.500
	Kdohkule	42+200(LHS)	42+840 (LHS)	0.640
	Wahiajer	42+850	45+645	2.795

2.5 Pavement

No Existing Pavement.

2.6 Junctions

No Existing Junction

2.7 At Grade Structures

No Existing Grade Structures

2.8 Cross-drainage Structures

No Existing Structures

2.9 Public Facilities

No Existing facilities

2.10 Utilities

Utilities are found within ROW at many locations. Electric lines are crossing at few locations on the project stretches. Similarly PHE and Gas pipeline are also observed.

Figure 2.3: Photograph of Utilities



	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Electric Line Crossing	Electric Line Crossing
	 Latitude: 25.522237 Longitude: 92.194482 Elevation: 1285.53±27.2 m Accuracy: 1.8 m
HT Line Crossing	HT Line Crossing

2.11 Road Furniture/Traffic Control Devices

Not Observed.

2.12 Side Drain along the project Road

Not Observed.

CHAPTER-3

ENGINEERING SURVEYS AND INVESTIGATIONS

3.1 Preliminary Surveys

The relevant engineering surveys and investigations have been carried out along the project roads conforming to IRC Specification. These Surveys have been conducted as per TOR to generate adequate database for preparing the most appropriate Improvement proposal for strengthening and upgrading the existing carriageway.

The various engineering surveys and investigations apart from the traffic surveys, which have been carried out for the project roads, are listed below:

- Road Inventory
- Road Pavement and Condition Survey
- Structure Inventory and Condition Survey
- Topographical Survey
- Pavement Investigations
- Soil and Material Investigations

The basic data collected from different engineering surveys and the results of the survey investigations and data analysis are compiled and presented as Appendix Topographical Survey details would be provided through separate report.

3.2 Road Inventory

The manner of analysis and further usage of the collected data is briefly explained in the following subparagraphs.

Road Inventory covering all the existing physical features such as terrain, land-use, roadway, carriageway width and type, shoulder width and type, Horizontal and Vertical alignments and design speed of existing road, type of cross-section (cut or fill), general drainage conditions, ROW boundaries, Sub-grade/Local soil type, location of water bodies and retaining structures, utility lines passing along or crossing the project roads, and all other features that may have influence on the project roads widening/improvement works.

The information collected, analysed and plotted will constitute the core database for formulating improvement proposals for further validation and finalization in the light of the results of the detailed surveys and investigations. In particular, action will be initiated in respect of the following:

- Decision on the location of the widening of carriageway if required, to be on the left, right or concentric with reference to the existing carriageway.
- Fitting in different typical cross-sections in the various stretches of the road in consideration of terrain conditions, available land width, roadside features etc.
- Treatment to be given to congested built-up stretches.

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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- The number of trees likely to be affected by the road improvement works, the expected environmental impacts, the extent of R&R implications etc.
- The location and number of places of worship, burial ground, etc. likely to be affected
- The utility lines by type, location and extent that would require relocation.

3.3 Terrain

The Project Road traverses through the **Ri-Bhoi, East Khasi Hills & West Jaintia Hills** Districts in the State of Meghalaya. The details of terrain are listed in the **earlier sections**.

3.4 Land use

The land use pattern along the project highway comprises mostly agricultural, whereas barren land and forest types of land are intermittent there. The details are as given in the **earlier sections**.

The Structure inventory and condition survey had been carried out on the following basis.

- Details of existing bridges/culverts such as type of structure, Clear span, vent height, hydraulic adequacy and condition have been measured at site and recorded.
- The condition of existing structures is based on visual observation. Design chainage in proposed road corridors have been considered taken for reference.
- The flow direction is indicated w.r.t the increasing chainage. In the entire stretch, no sign of river overtopping could be found on any existing structure.

CHAPTER-4

SOCIO-ECONOMIC PROFILE

4.1 General

This Chapter provides a socio-economic profile of the state and the relative status of the project influence area within the state. The aspects covered include demography, employment pattern, state income and major economic sectors including transport infrastructure. The profile discusses the past performance and the present scenario and, also presents a broad assessment of the perspective growth of the economy as a basis for estimating the future growth in transport demand.

4.2 Project Influence Area (PIA)

The Project Influence Area (PIA) is the relative importance of the project road in terms of the share of traffic contributed by various states/ districts. The broad influence area of the project road is taken as the State of Meghalaya since majority of the traffic served by the road is from the state. The immediate influence area consists of the districts of Ri-Bhoi, East Khasi Hills & West Jaintia Hills Districts through which the corridor passes and hence the areas directly served by the project road.

The Major villages along the project road are Pyllun, Sumer umbang, Lumsohpetbneng, Mawpun Kshaid, Umeit, Umdohbyrthih, Umroi Madan, Umroi Labansaro, Syllei-U-Lar, Umsawriang, Umktieh, Nongrah, Lumdaitkhla, Nonglakhait, Umsarang, Lumsophoh, Wahmyntait, Mawsiatkhnam, Lumkseh, Lumdiengsai, Mawpdang (Mawkhanu), Diengpasoh (Jaroid), Nonghali, Mawryngkneng (Mawiong Sung), Nongkhroh, Thadmusem, Sohphoh, Larnai, Kdohkule, Wahiajer. The design length of the Pkg-1 project road is **45.645 Km**.

A detailed accounting of the socio-economic profile of the Project Influence Area (PIA) has been prepared which covers the PIA's economic performance of the past and establishes the likely growth prospects of the future. The output of this Chapter is the economic growth prospects of the PIA with respect to certain selected economic variables and serves as the basis for arriving at a realistic traffic growth rate.

4.3 Demographic Profile of PIA

As per the census of India 2011, the total population of Meghalaya is 29,67,000 out of which 79.93% and 20.07% are rural and urban population, respectively. Total population of North Garo Hills district is 1,18,325 and total population of East Garo Hills district is 3,17,917. Further details of the Rural and Urban areas are mentioned respectively in Table 4.1.

Figure 4.1: Location Map of Meghalaya

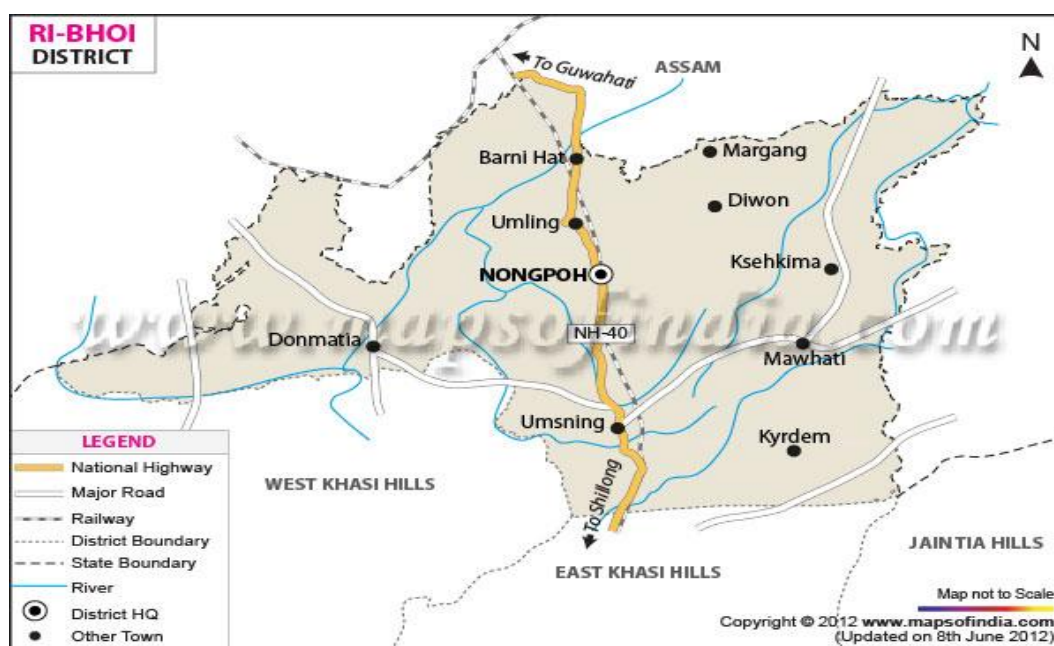


Table 4.1: Demographic Profile of Project Region

State/ District	Year	Population			% Of Urban Population	Avg. Density (pop./sq.km)
		Total	Rural	Urban		
Meghalaya	2021	38,64,559	30,88,950	7,75,619	20.07	172
PROJECT AREA DISTRICTS						
Ri- Bhoi	2021	3,23,000	291,475	31,525	9.76	132
East Khasi Hills	2021	9,76,000	542,949	433,051	44.37	355
West Jaintia Hills	2021	2,70,352	2,41,932	28,420	10.51	159.69

Ri-Bhoi District - Ri Bhoi District came into existence and assumed the hierarchical status of the district on the 4th June 1992 by upgrading the former Civil Sub-Division. The district was carved out from the erstwhile East Khasi Hills District and lies between North Latitudes 25°15' and 26°15' and between East Longitudes 91°45' and 92°15'. It geographically comprises parts of the Khasi kingdoms viz parts of Myllem Syiemship, Khyrim Syiemship, Nongspung Syiemship, Nongkhlaw Syiemship, whole of Nongpoh Sirdarship (erstwhile Nongpoh Syiemship), Myrdon Sirdarship and the erstwhile Nongwah Syiemship. Presently, Nongwah Syiemship is one of the missing Khasi States that calls for restoration both administratively and territorially. Presently, the District is bounded on the North by the Kamrup, Morigoan and Nagoan Districts of Assam, on the East by the Karbi Anglong District of Assam, on the South by East Khasi Hills & West Khasi Hills Districts and on the West by the West Khasi District. Nongpoh is the district headquarter and as well as that of Nongpoh Sirdarship. Ri Bhoi District contains an area of 2448.00 Sq. KMS excluding the geographical areas under the erstwhile Nongwah Syiemship and other places which fall under the 'Areas of Differences' between Assam and Meghalaya. Nongpoh is near to the two major cities of Shillong and Guwahati and hence is an easy to reach place. It is located at 53 km away from the Shillong and 50 km from Guwahati.

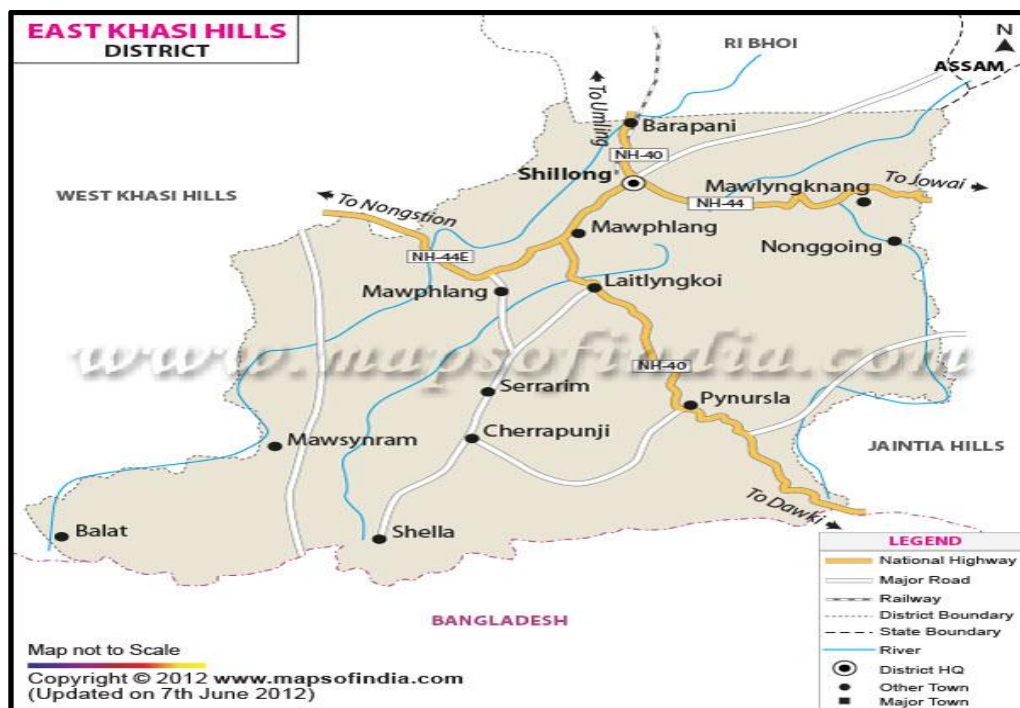
Figure 4.1(a): Location Map of Ri bhoi District



East Khasi Hills District - East Khasi Hills is one of the 12 (twelve) districts of the State of Meghalaya. The district occupies an area of 2,748 Sq. Kms. and it lies between 25°07" & 25°41" N Lat. and 91°21" & 92°09" E Long. bounded by Ri-Bhoi District on the north, Karbi Anglong District on the north east, Jaintia Hills district on the east, Bangladesh on the south and West Khasi Hills district on the west.

Shillong is the District Headquarter of East Khasi Hills District as well as the state Capital. It is a hill stations with unique natural scenic beauty which is an ideal resort throughout the year. The district is well connected with motorable roads throughout the length and breadth.

Figure 4.1 (b): Location Map of East Khasi Hills District



West Jaintia Hills District - West Jaintia Hills District is one of the 11 (eleven) districts of the state of Meghalaya. With the bifurcation of the erstwhile Jaintia Hills District into East and West Jaintia Hills District, West Jaintia Hills District came into existence on 31st July 2012 with its Head Quarter at Jowai. Jowai is the host of all the heads of important governmental offices and establishments, educational institutions, hospitals, banking institutions, etc.

The total area of the district is 1693 Sq.kms. The district comprises of 1(one) Civil Sub-Division Viz. Amlarem Civil Sub-Division and 3(three) Community and Rural Development Blocks viz. Amlarem C & RD Block, Laskein C&RD Block and Thadlaskein C&RD Block with the following boundaries: -

North – Assam

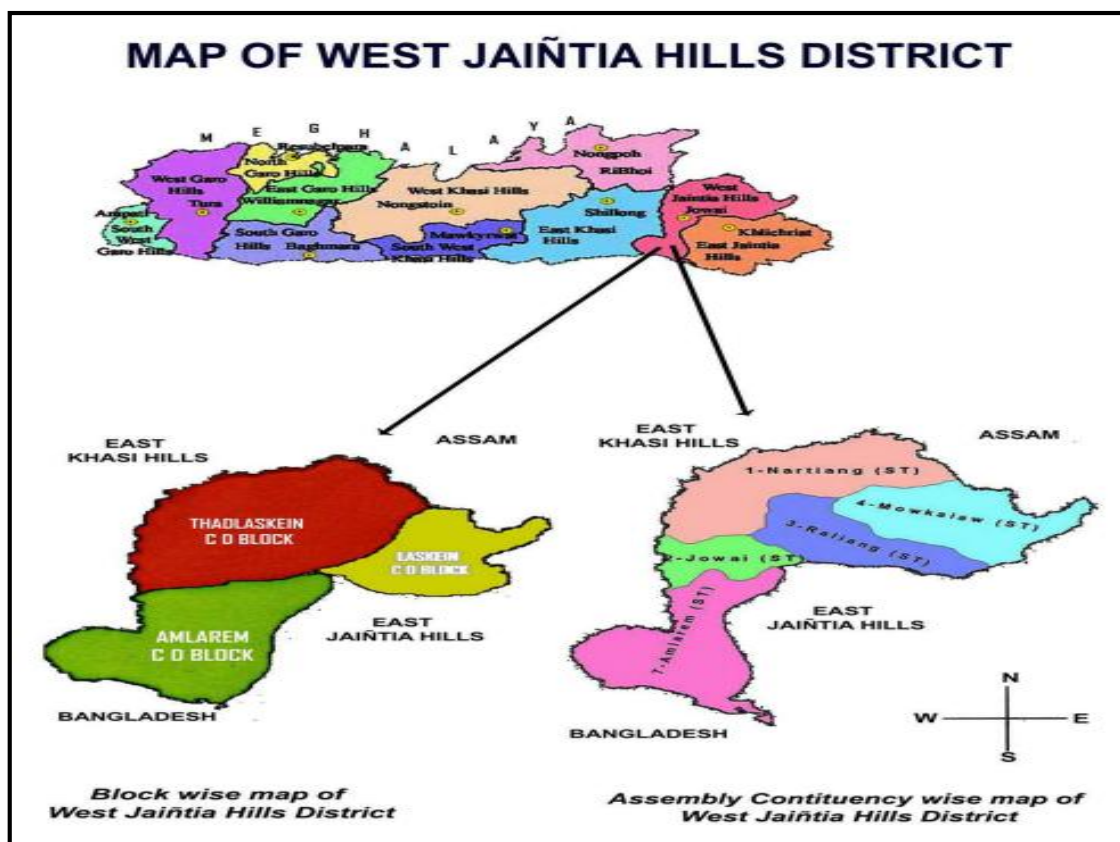
South – Bangladesh and East Jaintia Hills District

East – Assam

West – East Khasi Hills District

The district has a total population of 2,70,352, of which 1,34,406 are males and 1,35,946 are females. The density of Population is 159.69 per sq. km.

Figure 4.1(c): Location Map of West Jaintia Hills District



4.3.1 Settlements/Villages

There are 30 settlements/villages along the road. The main settlements/villages are given in below.

Name of Village	Chainages (Km)		Length (in Km)
	From	To	
Sumer umbang	0+000	1+370	1.370
Pyllun	1+370	3+730	2.360
Lumsohpetbneng	3+730	6+075 (LHS)	2.345
Mawpun Kshaid	5+020 (RHS)	5+280 (RHS)	0.260
Umeit	5+200 (LHS)	7+270	2.070
Umdohbyrthih	7+270	9+230	1.960
Umroi Madan	9+230	9+620	0.390
Umroi Laban saro	9+620	10+960	1.340
Syllei-U-Lar	10+830 (LHS)	10+958 (LHS)	0.128
Umsawriang	11+200 (LHS)	11+250 (LHS)	0.050
Umkatieh	11+768 (LHS)	11+943 (LHS)	0.175
Nongrah	10+960	13+080	2.120
Lumdaithkha	13+080	15+450 (LHS)	2.370
Nonglakhait	15+400	17+039	1.639

Name of Village	Chainages (Km)		Length (in Km)
	From	To	
Umsarang	17+039	18+360	1.321
Lumsophoh	18+360	18+936	0.576
Wahmyntait	20+555	21+770	1.215
Mawsiatkhnem	18+830	20+600	1.770
Lumkse	21+770	23+680	1.910
Lumdiengsai	23+680	24+683	1.003
Mawpdang (Mawkhanu)	24+683	28+192	3.509
Diengpasoh (Jaroit)	28+192	32+070	3.878
Nonghali	32+070	33+431	1.361
Mawryngkneng (Mawiong Sung)	33+431	35+213	1.782
Nongkhroh	35+213	37+155	1.942
Thadmusem	37+155	39+635	2.480
Sophoh	39+635	42+400 (RHS)	2.765
Larnai	42+400 (RHS)	42+900 (RHS)	0.500
Kdohkule	42+200(LHS)	42+840 (LHS)	0.640
Wahiajer	42+850	45+645	2.795

4.4 Employment Structure

As per 2011 Census, the state has a total workforce of 29,66,889 consisting of 14,91,832 male workers, 14,75,057 female workers and total non-workers are 17,81,270.

As per 2011 Census, the details of the Work force Participation in State and PIA are given in Table 4.2.

Table 4.2: Workforce Participation in State and PIA

STATE/PIA	Total Workers	Males	Females	Non workers
Meghalaya	29,66,889	14,91,832	14,75,057	17,81,270
<u>PROJECT INFLUENCED AREA</u>				
Ri-bhoi	1,06,473	63,871	42,602	1,52,367
East Khasi Hills	3,26,786	2,04,303	1,22,483	4,99,136
West Jaintia Hills	1,02,057	63,145	42,002	1,00,352

*Source: Census, 2011

Table 4.3: Distribution of workers by Economic Activity (%)

State/District's	Cultivators	Agricultural laborer's	Household Industry
Meghalaya	16.67	6.68	0.69
<u>PROJECT INFLUENCED AREA</u>			
Ri-Bhoi	52.44	18.77	1.57
East Khasi Hills	53.44	17.77	1.58
West Jaintia Hills	52.55	15.63	1.32

*Source: Census, 2011

4.5 State Income

The per capita income during 2019-20 at constant 2011-12 prices (NSDP) is estimated at Rs. 66,153 while the per capita income of Rs. 62,458 was registered in financial year 2018-19. The per capita income during 2019- 20 at current prices is estimated at Rs. 92,174 while per capita income during 2018-19 stood at Rs. 84,725 at current Prices. The projected per capita income at current and constant 2011-12 prices for the year 2020-21 are roughly estimated at Rs. 99,623 and Rs. 68,848, respectively. Prices are presented in **Table 4.4**.

Table 4.4: Trends of Per Capita Income

Year	Constant Prices	Current Prices
2011-12	60,013	60,013
2012-13	59,703	64,036
2013-14	58,681	65,118
2014-15	55,880	64,638
2015-16	56,039	68,836
2016-17	57,752	73,753
2017-18	58,493	77,504
2018-19	62,458	84,725
2019-20	66,153	92,174
2020-21	69,848	99,623

*Source: Reserve Bank of India

4.6 Sectorial Growth Rate

The overall view of sectorial composition of the state economy at constant prices for 1999-2000 to 2007-08 is tabulated in **TABLE 4.5**.

Table 4.5: Sector wise Percentage Contribution of GSDP at Constant Prices (In Crores)

Components	FY02	FY05	FY07
Primary	22.99	22.58	21.94
Secondary	23.70	24.24	25.70
Tertiary	53.31	53.18	52.36
Total GSDP	100.00	100.00	100.00

*Source: Directorate of Economics and Statistics, Meghalaya

Tertiary sector contributes around 52% in GSDP followed by the secondary and primary sectors both at 28% AND 22% in FY2008. Share of secondary sector in the GSDP has also shown growth, it has grown from 24% in FY2002 to 26% in the FY2007. However, the share of primary sector has come down from 23% to 21% during the same period.

4.7 Main Economic Sectors

Agriculture and allied sector

The economy of the state has been divided into three broad sectors, viz. Agriculture and Allied Activities which include Agriculture proper, livestock, fishing activities and forestry & logging; Industrial sector which includes Manufacturing, Mining and Quarrying, Construction; and Services sector. On analysing the three sectors, though Meghalaya is primarily an agriculture economy with

agricultural activities engaging nearly 63% of the total workforce, yet the contribution of this sector towards the economy of the state during 1999-2000 to 2007-08 is between 18.70% and 23.96% according to NSDP estimates at current prices. The share of the Industrial sector being in the range of 21.09% to 26.42%. On the other hand, the share of service sector in terms of percentage contribution during the same periods, have been between 53.21% at the lowest and 54.95% at the highest. The summary is shown in **Table 4.6**.

Table 4.6: Summary of Agro Statistics

S. No	Component	Growth/Ratio/Production
1	Agriculture GSDP at Current prices (FY2020-21)	Rs. 6,91,070 Lakhs
2	Agricultural sector's contribution to State's GDP (FY 2020)	20.17 %
3	Food Grains Production (FY2019)	360.8 (Thousand Tonnes)
4	State's contribution to national food grain production (FY2019)	0.09%
5	State's rank in national food grains production (FY2018)	26
6	Cropping Intensity (FY2018-19)	122.4%
7	Gross area Irrigated (FY 2018-19)	142.0 (Thousand Hectare)
8	Gross sown area (FY2018-19)	312.0 (Thousand Hectare)
9	Population dependent on agriculture	70%
10	Rice Production (FY 2019)	303.4 (Thousand Tonnes)
11	Wheat Production (FY2019)	0.9 (Thousand Tonnes)
12	Coarse Cereals (FY2019)	44.5 (Thousand Tonnes)
13	Pulses (FY2019)	8.3 (Thousand Tonnes)
14	Oilseeds (FY 2019)	15.1 (Thousand Tonnes)
15	Fruits (FY2019)	393.5 (Thousand Tonnes)
16	Raw Jute & Mesta (FY2019)	95.0 (Thousand Tonnes)

*Source: Ministry of Agriculture and Farmers Welfare, Government of India

Meghalaya's food grain production has shown good growth during the last decade. It has grown more than 23% between FY2009 and FY2019. During FY2009, food grain production of Meghalaya was 236.3 thousand tonnes, which has increased to 260.7 thousand tonnes in the FY2019 as shown in **Table 4.7**.

Table 4.7: Food Grain Production in Meghalaya (Thousand Tones)

Year	Meghalaya	India	Share of Meghalaya in India (%)
FY 2009	236.3	234466.2	0.10
FY 2010	239.2	218107.4	0.10
FY 2011	239.0	244491.8	0.09
FY 2012	249.1	259286.0	0.09
FY 2013	265.0	257124.7	0.10
FY 2014	320.0	265047.7	0.12

Year	Meghalaya	India	Share of Meghalaya in India (%)
FY 2015	353.8	252025.0	0.14
FY 2016	357.7	251541.6	0.14
FY 2017	260.1	275111.7	0.09
FY 2018	361.8	285013.2	0.12
FY 2019	260.7	285209.4	0.09
FY 2020	353.8	252025.0	0.14
FY 2021	360.8	297504.5	0.12

*Source: - Ministry of Agriculture and Farmers Welfare, Government of India

Due to hilly terrain, food grains cannot be cultivated on large areas in Meghalaya, more over the yield per hectare is also relatively low in the state, as a result the production of food grains in the state is low and share of Meghalaya in India's food grain production is stagnant at around 0.1% over the last few years.

Industries

Keeping in view the fact that the state of Meghalaya lags in industrial development, a need had been felt for structured interventionist strategies to accelerate industrial development of the state and boost investor's confidence. The industrial policy of 2012 was instituted with this view and it has been extended till 20 December 2022 to sustain the process of industrial progress with additional MIIPS 2016 Scheme. The state had laid great stress on ensuring that the incentives and subsidies reached the genuine industrialists without much loss of time. The new initiatives would provide the required incentives as well as an enabling environment for industrial development; it would improve availability of capital and increase market access to provide a fillip to the private investment in the state.

Highlights of Industrial policy

- Developing world class infrastructure is essential for speedy industrial development. The policy lays emphasis on inviting private sector to participate in infrastructure development.
- With a view to encourage industrialization of the backward blocks of the state, the Capital Investment Subsidy (CIS) under state's incentive package shall be extended to these blocks. The CIS of the state is attractive, and it makes provision for a 30% subsidy subject to a limit of Rs. 100 lakhs and the definition of investment is more comprehensive.
- Enterprises will be reimbursed 100% on the amount of GST actually paid on purchases of such machinery and equipment's which are genuinely required as is installed up to the date of commissioning of the unit subject to a ceiling of Rs.100.00 lakhs. The above said concession shall be extended to State GST only.
- Subsidy on interest payments to Banks/Financial Institutions will be provided at the rate of 4 % (four percent) with a ceiling of Rs.30000.00 per month on term loans (excluding working capital loans) availed by an entrepreneur for setting up of approved enterprises for a period of 3 (three) years from the date of disbursement of the loan.
- 50 % of the cost of approved pollution control measures will be reimbursed up to a maximum of Rs.25.00 lakhs per unit.

- Export Oriented Units exporting minimum 25% of its installed capacity for at least 3 consecutive years, shall be given additional 15% capital investment subsidy subject to a maximum of Rs.50 lakhs.

GSDP for industrial sector.

Transport

Transport plays a vital role in the economic and social development of the state. The state is served by road, rail, and air. Road is the predominant mode with a network spread over the entire state and plays an important mode for inter-city and inter-regional movement, as also the most economic for short and medium haul traffic.

Table 4.8: Net State Domestic Product by Industry of Origin: 2011-12 to 2016-17 at Constant (2011-12) Prices in Lacs

SL. No	Industry	2011-12	2012-13	2013-14	2014-15 (P)	2015-16 (Q)	2016-17 (Adv)
1	Agriculture	204717	234615	244101	250679	262835	276484
2	Forestry & Logging	55478	54078	55209	55665	55947	56512
3	Fishing	3602	4353	4678	4942	9281	11121
Sub-total (Agriculture and allied activity)		263797	293046	303988	311286	328063	344117
4	Mining & Quarrying	122605	100061	140983	61928	63315	64492
5	Manufacturing	426023	422228	338181	356714	381478	405157
6	Construction	108427	91971	93689	109384	111810	112844
7	Electricity, Gas, Water Supply & Utilities Services	37234	31555	36781	34197	34496	35596
Subtotal		694289	645815	609634	562223	591099	618089
8	Transport, Storage and Communication	70884	79030	77804	79609	90714	107013
9	Trade, Hotel and Restaurant	252217	292209	320980	320476	349648	379902
10	Banking and Insurance	54943	54468	54513	60309	64022	67373
11	Real Estate, Ownership of Dwellings and Business Services	94498	94995	96137	99190	105174	107412
12	Public Administration	137555	130380	136201	150551	149481	158580
13	Other Services	135067	137905	146575	164375	182066	201596
Subtotal		745123	788986	832210	874509	941105	1021876
14	Net State Domestic Product	1703209	1727848	1745831	1748018	1860267	1984083
15	Population (Projected Mid-Year figure as per 2011 Census)	3004	3069	3135	3202	3271	3341
16	Per Capita Income (in Rs.)	56698	56300	55688	54591	56872	59386

*Source: - Directorate of Economics and Statistics, Meghalaya.

Road Transport

ROAD NETWORK

Meghalaya has a road network of around 7,633 km, out of which 3,691 km is black-topped and the remaining 3,942 km is gravelled. Meghalaya is also connected to Silchar in Assam, Aizawl in Mizoram, and Agartala in Tripura through national highways. The Meghalaya State Transport Corporation operates public bus services in the state owned by the state government. It operates hundreds of buses connecting different parts of the state even to small villages due to presence of huge network of roads. The central government has attached high priority to the development and up-gradation of its vital road network. is shown in **Table 4.9**.

National Highways that pass-through Meghalaya include NH 6, NH 106, NH 206 & NH 217.

Table 4.9: ROAD LENGTH (KM) BY CATEGORY OF ROAD IN MEGHALAYA

Category of Road	Length in KM
National Highways	1205.338
State Highways	751.59
Major district Roads	1433.904
Other District Roads	3299.237
Village Roads (State)	2072.207
Village Roads (P.M.G.S.Y)	549.221
Urban Roads	355.351
Total	9666.848

*Source: - As on 31-03-2015, Meghalaya P.W.D.(Roads)

Economic Perspective-Project Area Economies

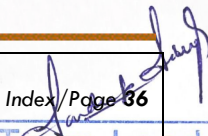
Meghalaya is predominantly an agrarian economy. Agriculture and allied activities engage nearly two-thirds of the total workforce in Meghalaya. However, the contribution of this sector to the State's NSDP is only about one-third. Agriculture in the state is characterized by low productivity and unsustainable farm practices. Despite the large percentage of the population engaged in agriculture, the state imports food from other Indian states. Infrastructural constraints have also prevented the economy of the state from creating high-income jobs at a pace commensurate with that of the rest of India. Meghalaya's gross state domestic product for 2012 was estimated at Rs. 16,173 crore in current prices. As of 2012, according to the Reserve Bank of India, about 12% of total state population is below poverty line, with 12.5% of the rural Meghalaya population is below the poverty line; while in urban areas, 9.3% are below the poverty line.

Meghalaya, being part of the Northeast India, also has some unique economic disadvantages arising out of remoteness and poor connectivity, hilly and often inhospitable terrain, vulnerability to natural disasters, a weak resource base, poor infrastructure, and shallow markets. Taken together, all these factors have resulted in low economic activity, low employment and low-income generation. These economic disadvantages have substantial implications for the size and nature of the development problem and for the approach to be adopted.

Gross fiscal deficit of Meghalaya was close to Rs. 978 Crores in FY2014 and then it rose to Rs. 1151 Crores (Revised Estimates) in FY2018. In the FY2019, it has gone to Rs 1323 Crores (Budget Estimates).

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Meghalaya has taken a fast leap in providing a conducive investment environment it offers boundless investment opportunities to the prospective investors. It has attracted industrial investment proposals of more than Rs. 468.55 crores in the fourth census (2006-07). State has rich resources of water, agro, forests, herbal and minerals in addition to its unparallel natural beauty with tremendous potential for investment in tourism sector.

Global Krishna JV			Index/ Page 36  Team Leader
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CHAPTER-5

TRAFFIC SURVEY AND ANALYSIS

5.1 Traffic Surveys – Background & Prologue

Traffic surveys have been conducted previously at various locations and after analysis of various data simulated from traffic surveys on ground, final traffic on project corridor and existing counterpart has been prepared. It is also highlighted that PMO has accorded the approval of project work with Lane-configuration, future prospects and other features of the flow of traffic. To avoid data misinterpretation and ambiguities in this reference, traffic established for finalisation of various project related proposals, is presented in sections ahead in this chapter. All data pertaining to various traffic surveys has already been presented and submitted at all levels of NHIDCL. It is therefore relevant to include the most relevant data features at this stage.

5.2 Traffic Surveys Analysis

5.2.1 AADT or Annual Average Daily Traffic

AADT or Annual Average daily traffic which forms the basis of all projections and relevant design for project work is presented below for year of 2023, 2025 (present year) and 2030 (year considered for road opened to traffic flow). Table below can be referred for AADT break-up considered for High-Speed Corridor or HSC. It is evident that traffic quantum upto 2029 year will undoubtedly include total traffic and from 2030 and onwards, traffic will be bifurcated for HSC and existing NH-06 alignment. Therefore, 2030-year data presents the traffic volume on HSC along with that plying on existing alignment after opening of project facility in this year.

Table 5.1: PCU Factors as per IRC 64

Sr. No.	Vehicle Type		PCU Factor
1	Two-Wheeler		0.50
2	Car/Jeep/ Van/Taxi/ Auto		1.00
3	BUS	Mini	1.50
4		Standard	3.00
5	LCV		1.50
6	Truck	2-Axle	3.00
7		3 -Axle	3.00
8		Multi-Axle/ with Trailer	4.50
9	Agricultural Tractor	With Trailer	4.50
10		Without Trailer	1.50
11	Cycle		0.50
12	Cycle Rickshaw		2.00
13	Hand Cart		3.00
14	Animal Drawn	Bullock Cart	8.00
15		Horse	4.00

The summary of AADT, as observed on the Project Road, in terms of numbers of vehicles and PCU are given in the **Table 5.3**.

Table 5.2: Summary of Annual Average Daily Traffic AADT (Nos) and AADT (PCU) (Year-2023 & 2025)

Traffic Composition	AADT (Nos)	AADT (PCU)	AADT (Nos)	AADT (PCU)
	Year 2023		Year 2025	
Two-Wheeler	164	82	181	91
Three-Wheeler/ Auto	1	1	1	1
Car/Jeep/Van/ Taxi	4637	4637	5112	5112
Mini Bus	13	19	14	21
Bus	32	96	35	106
LCV	657	986	725	1087
2-Axle Truck	1369	4108	1510	4529
3-Axle Truck	421	1263	464	1392
M-Axle Truck	1466	6598	1617	7275
Tractor With Trailer	1	2	1	3
Tractor Without Trailer	2	2	2	3
Total Fast-Moving Vehicles (FMV)	8763	17795	9661	19619
Cycle	10	5	11	5
Cycle Rickshaw	0	0	0	0
Hand Cart	0	0	0	0
Bullock Cart	0	0	0	0
Horse Cart	0	0	0	0
Total Slow-Moving Vehicles (SMV)	10	5	11	5
Total	8773	17800	9672	19624
CVPD	3959	—	4364	—
Toll-able Traffic	8595	17707	9476	19522

Table 5.3: Summary of Annual Average Daily Traffic AADT (Nos) and AADT (PCU) on Existing NH-06 (Year-2030)

Traffic Composition	AADT (Nos)	AADT (PCU)	AADT (Nos)	AADT (PCU)
	Year 2030 (Existing NH-06)		Year 2030 (High Speed Corridor)	
Two-Wheeler	46	23	185	93

Traffic Composition	AADT (Nos)	AADT (PCU)	AADT (Nos)	AADT (PCU)
	Year 2030 (Existing NH-06)		Year 2030 (High Speed Corridor)	
Three-Wheeler/ Auto	0	0	1	1
Car/Jeep/Van/ Taxi	1305	1305	5219	5218
Mini Bus	4	5	14	22
Bus	9	27	36	108
LCV	185	277	740	1110
2-Axle Truck	385	1156	1542	4625
3-Axle Truck	118	355	474	1422
M-Axle Truck	413	1857	1651	7428
Tractor With Trailer	0	1	1	3
Tractor Without Trailer	0	1	2	4
Total Fast-Moving Vehicles (FMV)	2466	5008	9864	20032
Cycle	3	1	11	6
Cycle Rickshaw	0	0	0	0
Hand Cart	0	0	0	0
Bullock Cart	0	0	0	0
Horse Cart	0	0	0	0
Total Slow-Moving Vehicles (SMV)	3	1	11	6
Total	2469	5009	9875	20037
CVPD	1114	—	4456	—
Toll-able Traffic	2419	4983	9676	19932

5.2.2 Vehicle Damage Factor

Values of the VDF for different sections are presented below:

Table 5.4: VDF observed on the Project Road

TYPE OF VEHICLES	Vehicle Damage Factor
	Adopted
M-Axle	10.00
3-Axle Truck	7.00
2-Axle Truck	3.00
Bus	0.40
Mini Bus	0.02
LCV	0.01



5.3.6 Traffic Projections

AADT has been projected adopting a growth of 5% from this instance and table below can be referred for yearly data summary.

Table 5.5: Traffic Forecasts for HSC (from 2030 Onwards)

Year	FAST MOVING VEHICLES											SLOW MOVING VEHICLES					Total (No)	Total (PCU)	Design Year/ Remark
	Two-Wheeler	Three-Wheeler/ Auto	Car/ Jeep/ Van/ Taxi	Mini Bus	Bus	LCV	2-Axle	3-Axle	M-Axle	Tractor With Trailer	Tractor Without Trailer	Cycle	Cycle Rickshaw	Hand Cart	Bullock Cart	Horse Cart			
2030	185	1	5219	14	36	740	1542	474	1651	1	2	11	0	0	0	0	9875	20037	1
2034	225	1	6344	17	44	899	1874	576	2006	1	2	13	0	0	0	0	12003	24355	5
2039	287	2	8097	22	56	1148	2391	735	2561	1	3	17	0	0	0	0	15320	31084	10
2044	367	2	10334	28	71	1465	3052	938	3268	1	4	22	0	0	0	0	19552	39672	15
2049	468	3	13189	36	91	1870	3895	1198	4171	2	5	28	0	0	0	0	24954	50633	20

Table 5.6: MSA CALCULATION SHEET.

Year	Mini Bus	Bus	LCV	2 Axle	3 Axle	M Axle	Total yearly CVs (nos.)	Cumulative yearly CVs (nos.)	Yearly Design ESA	Cumulative Design ESA	MSA	Design year
VDF	0.022	0.403	0.013	3.000	7.000	10.000						
Considering 50% of CPVD in each direction												
2030	7	18	370	771	237	825	813262	813262	3349620	3349620	3	1
2034	9	22	450	937	288	1003	988525	4493787	4071484	18508763	19	5
2039	11	28	574	1196	368	1280	1261637	10229124	5196360	42131157	42	10



DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM

**MAIN
REPORT
(DPR)**

2044	14	36	732	1526	469	1634	1610203	17549029	6632018	72279982	72	15
2049	18	45	935	1948	599	2085	2055073	26891290	8464322	110758372	110	20

5.3.8 Pavement Crust Thickness of Flexible Pavement for New Construction

As per Pavement Design Catalogue of IRC 37: 2018, flexible pavement thickness required is as follows:

Table 5.7: Proposed Flexible Pavement Composition

Section	Design Period (Years)	Adopted MSA	CBR (%)	Pavement Crust Compositions				
				BC (mm)	DBM (mm)	WMM (mm)	CTSB (mm)	Total (mm)
Main C/w (HSP)	20	110	9	50	100	150	200	500
Ramps/ Approach Roads	20	30	9	40	50	150	200	440

Note: Design MSA adopted for Service Roads/Ramps/Approach Roads as per NHAI Policy Circular No. 11.54/2023, dtd.30.10.2023

Calculation of Elastic Modulus values for Layers has been presented below:

S. No.	Layers	Elastic Modulus (MPa)	References
1.	BC with modified with bitumen	1600	Table 9.1 of IRC 37-2018
2.	DBM	350	Table 11.1 of IRC 37-2018
3.	WMM	600	Table 11.1 of IRC 37-2018
4.	CTSB	3000	Table 11.1 of IRC 37-2018
5.	Subgrade	71.82	Derived as per IRC 37- 2018

VIEW RESULTS

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No. of layers	5									
E values (MPa)	1600.00	3000.00	350.00	600.00	71.82					
Mu values	0.350.350.350.250.35									
thicknesses (mm)	50.00	100.00	150.00	200.00						
single wheel load (N)	20000.00									
tyre pressure (MPa)	0.56									
Dual Wheel										
Z	R	SigmaZ	SigmaT	SigmaR	TaoRZ	DispZ	epZ	epT	epR	
150.00	0.00	-0.1457E+00	0.5111E+00	0.3979E+00	-0.1911E-01	0.3334E+00	-0.1546E-03	0.1410E-03	0.9000E-04	
150.00L	0.00	-0.1457E+00	-0.9676E-02	-0.2289E-01	-0.1911E-01	0.3334E+00	-0.3838E-03	0.1410E-03	0.8999E-04	
150.00	155.00	-0.1241E+00	0.4138E+00	0.1208E+00	-0.6688E-01	0.3401E+00	-0.1037E-03	0.1383E-03	0.6449E-05	
150.00L	155.00	-0.1241E+00	-0.1074E-01	-0.4493E-01	-0.6688E-01	0.3401E+00	-0.2989E-03	0.1383E-03	0.6452E-05	
500.00	0.00	-0.2038E-01	0.8125E-01	0.6897E-01	-0.3272E-02	0.2747E+00	-0.9656E-04	0.1152E-03	0.8959E-04	
500.00L	0.00	-0.2038E-01	0.1019E-02	-0.3424E-03	-0.3271E-02	0.2747E+00	-0.2871E-03	0.1152E-03	0.8958E-04	
500.00	155.00	-0.2191E-01	0.8704E-01	0.7806E-01	-0.4683E-02	0.2821E+00	-0.1053E-03	0.1217E-03	0.1030E-03	
500.00L	155.00	-0.2191E-01	0.1108E-02	0.1126E-03	-0.4686E-02	0.2821E+00	-0.3111E-03	0.1217E-03	0.1030E-03	

The calculated pavement thicknesses have been checked by IIT-PAVE software.

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Note: All calculations have been done as per IRC-37.

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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CHAPTER-6

IMPROVEMENT PROPOSALS

6.1 General

As discussed earlier in this report, high speed corridor will be developed as a 4-lane facility throughout the length. This chapter deals with proposals such culverts, CD structure, crossing/access facilities, cross sections along length, flyovers, protection measures etc. are presented ahead in this chapter.

This corridor will be developed having controlled access at pre-determined places only and no direct merging/diverging is provided throughout. Suitable length provision for service roads/ramps etc. has been proposed near access points.

For the ease of traffic movement and construction of the project road alignment has been designed in way that the project road packages traffic movement of proposed section can access the existing road. This arrangement will help in traffic movement while construction of adjacent packages. Public facilities have also been provisioned at appropriate locations.

Design of the project roads includes following design components:

- Present traffic and future projections;
- Analysis and design of pavement;
- Determination of requirements for the new pavement;
- Determination of adequacy of the hydraulic capacity and structural parameters of the existing structures;
- Determination of adequacy of the road's geometry (horizontal as well as vertical)
- Determination of adequacy of intersections and improvement measures; and
- Ensuring road safety aspects and these are addressed through provision of traffic control devices, roadside furniture and project facilities.

6.2 Alignment and Geometry

Table 6.1: Summary of Horizontal Geometric Alignment

Sr. No.	Radius (m)	Design Speed	Detail of Horizontal Curves. (Nos.)	Length (m)	Percentage (%)
		(Km/hr.)			
1	75-399	Below 80	0	0	0.00%
2	400-500	80	28	7333	16.06%
3	501-600	80	6	2030	4.45%
4	601-700	80	1	106	0.23%
5	>701	80	25	6749	14.79%
	Transition Length			2400	5.26%
	Straight Length			27027	59.21%
	Total			45645	100.00%

Table 6.2: Summary of Vertical Geometric Alignment

Sr. No.	Gradient (%)	Length (m)	Percentage (%)
1	<3%	9425.159	20.65%
2	3-4%	2496.544	5.47%
3	4-5%	5287.095	11.58%
4	5-6%	0	0.00%
5	More than 6%	0	0.00%
	Curve Length (m)	28436.202	62.30%
	Total (m)	45645	100.00%

Note: It may also be mentioned that complete vertical profile has been duly designed as per IRC SP 23 specifications by adopting adequate length, sight distance etc. and no unrequired curve (Horizontal/Vertical) has been proposed in geometry.

6.3 Proposed Right of Way (ROW)

PROW has been worked out considering a uniform length of a single PROW, otherwise it would change at every 10 m interval and thereby making the field JMS processes very cumbersome. This has been duly finalized with consensus and directives of the authority. Proposed ROW will be as per the table given below:

For Main Carriageway & Interchanges Included PROW

Table 6.3: Proposed Right of Way (ROW)

Main Carriageway

PROW SUMMARY						
S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
1	600	700	100	110.0	65.0	175.0
2	700	960	260	110.0	75.0	185.0
3	960	970	10	110.0	60.0	170.0
4	970	1060	90	80.0	60.0	140.0
5	1060	1660	600	80.0	50.0	130.0
6	1660	1930	270	48.0	50.0	98.0
7	1930	2030	100	58.0	50.0	108.0
8	2030	2180	150	74.0	50.0	124.0
9	2180	2290	110	74.0	38.0	112.0
10	2290	2380	90	104.0	38.0	142.0
11	2380	2440	60	104.0	30.0	134.0
12	2440	2480	40	86.0	30.0	116.0



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
13	2480	2580	100	86.0	23.0	109.0
14	2580	2610	30	50.0	23.0	73.0
15	2610	2710	100	50.0	34.0	84.0
16	2710	2750	40	68.0	34.0	102.0
17	2750	2880	130	117.0	34.0	151.0
18	2880	2940	60	78.0	34.0	112.0
19	2940	3030	90	40.0	34.0	74.0
20	3030	3090	60	40.0	50.0	90.0
21	3090	3120	30	108.0	50.0	158.0
22	3120	3220	100	108.0	26.0	134.0
23	3220	3290	70	74.0	26.0	100.0
24	3290	3310	20	94.0	38.0	132.0
25	3310	3460	150	135.0	38.0	173.0
26	3460	3480	20	135.0	28.0	163.0
27	3480	3550	70	75.0	28.0	103.0
28	3550	3640	90	120.0	28.0	148.0
29	3640	3670	30	74.0	28.0	102.0
30	3670	3760	90	74.0	30.0	104.0
31	3760	3800	40	46.0	30.0	76.0
32	3800	3850	50	46.0	23.0	69.0
33	3850	3890	40	46.0	30.0	76.0
34	3890	3990	100	76.0	30.0	106.0
35	3990	4010	20	82.0	30.0	112.0
36	4010	4120	110	82.0	36.0	118.0
37	4120	4130	10	82.0	34.0	116.0
38	4130	4200	70	84.0	34.0	118.0
39	4200	4280	80	56.0	34.0	90.0
40	4280	4350	70	40.0	34.0	74.0
41	4350	4390	40	40.0	30.0	70.0
42	4390	4470	80	48.0	30.0	78.0
43	4470	4520	50	48.0	24.0	72.0
44	4520	4550	30	34.0	24.0	58.0
45	4550	4630	80	34.0	36.0	70.0
46	4630	4670	40	56.0	42.0	98.0
47	4670	4700	30	56.0	74.0	130.0
48	4700	4710	10	56.0	74.0	130.0
49	4710	4740	30	27.5	74.0	101.5

PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
50	4740	4870	130	27.5	27.5	55.0
51	4870	4990	120	27.5	36.0	63.5
52	4990	5030	40	27.5	72.0	99.5
53	5030	5050	20	27.5	72.0	99.5
54	5050	5070	20	44.0	72.0	116.0
55	5070	5090	20	44.0	80.0	124.0
56	5090	5110	20	44.0	80.0	124.0
57	5110	5140	30	72.0	80.0	152.0
58	5140	5190	50	40.0	80.0	120.0
59	5190	5250	60	40.0	84.0	124.0
60	5250	5330	80	136.0	84.0	220.0
61	5330	5350	20	110.0	84.0	194.0
62	5350	5360	10	110.0	36.0	146.0
63	5360	5410	50	110.0	36.0	146.0
64	5410	5470	60	27.5	27.5	55.0
65	5470	5590	120	58.0	28.0	86.0
66	5590	5610	20	58.0	36.0	94.0
67	5610	5620	10	46.0	36.0	82.0
68	5620	5730	110	46.0	36.0	82.0
69	5730	5760	30	46.0	28.0	74.0
70	5760	5850	90	46.0	28.0	74.0
71	5850	5890	40	46.0	30.0	76.0
72	5890	6070	180	50.0	30.0	80.0
73	6070	6130	60	27.5	27.5	55.0
74	6130	6150	20	38.0	34.0	72.0
75	6150	6270	120	130.0	34.0	164.0
76	6270	6280	10	130.0	36.0	166.0
77	6280	6330	50	130.0	36.0	166.0
78	6330	6350	20	123.0	36.0	159.0
79	6350	6410	60	123.0	27.0	150.0
80	6410	6430	20	123.0	64.0	187.0
81	6430	6510	80	146.0	64.0	210.0
82	6510	6560	50	151.0	134.0	285.0
83	6560	6610	50	151.0	134.0	285.0
84	6610	6730	120	147.0	82.0	229.0
85	6730	6890	160	147.0	58.0	205.0
86	6890	6930	40	128.0	58.0	186.0



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
87	6930	7010	80	128.0	38.0	166.0
88	7010	7110	100	112.0	38.0	150.0
89	7110	7150	40	100.0	36.0	136.0
90	7150	7210	60	32.0	36.0	68.0
91	7210	7220	10	36.0	36.0	72.0
92	7220	7250	30	36.0	30.0	66.0
93	7250	7310	60	32.0	30.0	62.0
94	7310	7350	40	32.0	40.0	72.0
95	7350	7410	60	48.0	31.0	79.0
96	7410	7430	20	48.0	28.0	76.0
97	7430	7470	40	36.0	28.0	64.0
98	7470	7570	100	32.0	28.0	60.0
99	7570	7630	60	32.0	44.0	76.0
100	7630	7710	80	40.0	44.0	84.0
101	7710	7750	40	40.0	32.0	72.0
102	7750	7790	40	44.0	32.0	76.0
103	7790	7810	20	44.0	32.0	76.0
104	7810	7840	30	44.0	50.0	94.0
105	7840	8070	230	27.5	27.5	55.0
106	8070	9290	1220	27.5	27.5	55.0
107	9290	9330	40	56.0	50.0	106.0
108	9330	9370	40	56.0	25.0	81.0
109	9370	9390	20	38.0	25.0	63.0
110	9390	9450	60	38.0	62.0	100.0
111	9450	9530	80	94.0	38.0	132.0
112	9530	9590	60	110.0	38.0	148.0
113	9590	9630	40	100.0	38.0	138.0
114	9630	9650	20	100.0	30.0	130.0
115	9650	9730	80	112.0	30.0	142.0
116	9730	9770	40	132.0	30.0	162.0
117	9770	9850	80	90.0	30.0	120.0
118	9850	9910	60	146.0	30.0	176.0
119	9910	9950	40	146.0	36.0	182.0
120	9950	9990	40	160.0	36.0	196.0
121	9990	10030	40	120.0	36.0	156.0
122	10030	10090	60	76.0	36.0	112.0
123	10090	10100	10	154.0	36.0	190.0

PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
124	10100	10130	30	154.0	36.0	190.0
125	10130	10150	20	122.0	36.0	158.0
126	10150	10170	20	122.0	26.0	148.0
127	10170	10230	60	100.0	26.0	126.0
128	10230	10250	20	40.0	26.0	66.0
129	10250	10330	80	40.0	38.0	78.0
130	10330	10470	140	27.5	27.5	55.0
131	10470	10490	20	27.5	27.5	55.0
132	10490	10510	20	27.5	40.0	67.5
133	10510	10590	80	27.5	40.0	67.5
134	10590	10810	220	27.5	27.5	55.0
135	10810	10880	70	43.0	43.0	86.0
136	10880	11010	130	43.0	43.0	86.0
137	11010	11050	40	43.0	43.0	86.0
138	11050	11170	120	33.0	43.0	76.0
139	11170	11190	20	36.0	43.0	79.0
140	11190	11290	100	36.0	36.0	72.0
141	11290	12330	1040	37.5	37.5	75.0
142	12330	13010	680	45.0	45.0	90.0
143	13010	13230	220	27.5	27.5	55.0
144	13230	13360	130	38.0	35.0	73.0
145	13360	13400	40	34.0	35.0	69.0
146	13400	13460	60	34.0	30.0	64.0
147	13460	13520	60	29.0	30.0	59.0
148	13520	13580	60	29.0	25.0	54.0
149	13580	13620	40	23.0	25.0	48.0
150	13620	13750	130	23.0	22.0	45.0
151	13750	13820	70	23.0	32.0	55.0
152	13820	13870	50	23.0	26.0	49.0
153	13870	13910	40	30.0	26.0	56.0
154	13910	13970	60	42.0	32.0	74.0
155	13970	14010	40	42.0	44.0	86.0
156	14010	14100	90	50.0	62.0	112.0
157	14100	14160	60	38.0	49.0	87.0
158	14160	14240	80	25.0	49.0	74.0
159	14240	14310	70	25.0	25.0	50.0
160	14310	14610	300	28.0	25.0	53.0



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
161	14610	14630	20	28.0	30.0	58.0
162	14630	14840	210	30.0	30.0	60.0
163	14840	14900	60	30.0	27.0	57.0
164	14900	15050	150	27.0	27.0	54.0
165	15050	15090	40	33.0	27.0	60.0
166	15090	15170	80	33.0	34.0	67.0
167	15170	15200	30	38.0	34.0	72.0
168	15200	15300	100	38.0	30.0	68.0
169	15300	15390	90	29.0	30.0	59.0
170	15390	15430	40	29.0	37.0	66.0
171	15430	15820	390	39.0	37.0	76.0
172	15820	15840	20	39.0	22.0	61.0
173	15840	16030	190	23.0	22.0	45.0
174	16030	16270	240	28.0	27.0	55.0
175	16270	16370	100	28.0	24.0	52.0
176	16370	16470	100	28.0	29.0	57.0
177	16470	16570	100	28.0	25.0	53.0
178	16570	16630	60	26.0	25.0	51.0
179	16630	16650	20	26.0	23.0	49.0
180	16650	16770	120	23.0	23.0	46.0
181	16770	16790	20	23.0	30.0	53.0
182	16790	16870	80	30.0	30.0	60.0
183	16870	16890	20	30.0	42.0	72.0
184	16890	17050	160	42.0	42.0	84.0
185	17050	17070	20	35.0	42.0	77.0
186	17070	17170	100	35.0	49.0	84.0
187	17170	17330	160	47.0	49.0	96.0
188	17330	17430	100	37.0	49.0	86.0
189	17430	17470	40	37.0	27.0	64.0
190	17470	17630	160	100.0	27.0	127.0
191	17630	17650	20	92.0	27.0	119.0
192	17650	17750	100	92.0	34.0	126.0
193	17750	17790	40	56.0	34.0	90.0
194	17790	17850	60	56.0	26.0	82.0
195	17850	17910	60	37.0	42.0	79.0
196	17910	17990	80	23.0	42.0	65.0
197	17990	18030	40	23.0	34.0	57.0

PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
198	18030	18150	120	28.0	34.0	62.0
199	18150	18190	40	28.0	30.0	58.0
200	18190	18290	100	118.0	30.0	148.0
201	18290	18330	40	118.0	53.0	171.0
202	18330	18430	100	138.0	53.0	191.0
203	18430	18450	20	138.0	49.0	187.0
204	18450	18570	120	109.0	49.0	158.0
205	18570	18580	10	88.0	49.0	137.0
206	18580	18610	30	88.0	49.0	137.0
207	18610	18620	10	88.0	64.0	152.0
208	18620	18670	50	88.0	64.0	152.0
209	18670	18680	10	56.0	64.0	120.0
210	18680	18790	110	56.0	64.0	120.0
211	18790	18830	40	56.0	64.0	120.0
212	18830	18950	120	26.0	24.0	50.0
213	18950	18970	20	54.0	24.0	78.0
214	18970	19050	80	54.0	31.0	85.0
215	19050	19070	20	36.0	31.0	67.0
216	19070	19130	60	36.0	46.0	82.0
217	19130	19150	20	36.0	23.0	59.0
218	19150	19230	80	76.0	23.0	99.0
219	19230	19250	20	76.0	49.0	125.0
220	19250	19370	120	33.0	49.0	82.0
221	19370	19390	20	33.0	26.0	59.0
222	19390	19470	80	62.0	26.0	88.0
223	19470	19830	360	27.5	27.5	55.0
224	19830	19930	100	59.0	30.0	89.0
225	19930	20090	160	27.5	27.5	55.0
226	20090	20230	140	42.0	44.0	86.0
227	20230	20380	150	42.0	40.0	82.0
228	20380	20970	590	27.5	27.5	55.0
229	20970	21030	60	39.0	46.0	85.0
230	21030	21070	40	39.0	82.0	121.0
231	21070	21190	120	34.0	82.0	116.0
232	21190	21250	60	28.0	54.0	82.0
233	21250	21360	110	28.0	46.0	74.0
234	21360	21430	70	27.5	27.5	55.0



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
235	21430	21510	80	34.0	40.0	74.0
236	21510	21570	60	34.0	40.0	74.0
237	21570	21660	90	26.0	40.0	66.0
238	21660	21670	10	26.0	40.0	66.0
239	21670	21770	100	26.0	25.0	51.0
240	21770	21910	140	26.0	30.0	56.0
241	21910	21920	10	26.0	30.0	56.0
242	21920	22030	110	26.0	30.0	56.0
243	22030	22060	30	34.0	65.0	99.0
244	22060	22130	70	34.0	65.0	99.0
245	22130	22190	60	34.0	118.0	152.0
246	22190	22210	20	37.0	118.0	155.0
247	22210	22330	120	37.0	128.0	165.0
248	22330	22390	60	37.0	98.0	135.0
249	22390	22430	40	31.0	98.0	129.0
250	22430	22570	140	31.0	85.0	116.0
251	22570	22650	80	52.0	76.0	128.0
252	22650	22710	60	52.0	30.0	82.0
253	22710	22790	80	34.0	30.0	64.0
254	22790	22810	20	34.0	34.0	68.0
255	22810	22950	140	27.0	34.0	61.0
256	22950	22970	20	42.0	34.0	76.0
257	22970	23130	160	42.0	42.0	84.0
258	23130	23230	100	28.0	31.0	59.0
259	23230	23310	80	42.0	31.0	73.0
260	23310	23350	40	42.0	22.0	64.0
261	23350	23410	60	39.0	22.0	61.0
262	23410	23470	60	39.0	30.0	69.0
263	23470	23570	100	28.0	30.0	58.0
264	23570	23590	20	28.0	49.0	77.0
265	23590	23690	100	39.0	49.0	88.0
266	23690	23760	70	39.0	65.0	104.0
267	23760	23770	10	39.0	65.0	104.0
268	23770	23810	40	24.0	65.0	89.0
269	23810	23930	120	24.0	50.0	74.0
270	23930	23970	40	40.0	50.0	90.0
271	23970	24030	60	40.0	63.0	103.0

PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
272	24030	24050	20	40.0	63.0	103.0
273	24050	24190	140	29.0	63.0	92.0
274	24190	24330	140	29.0	28.0	57.0
275	24330	24450	120	36.0	30.0	66.0
276	24450	24530	80	32.0	30.0	62.0
277	24530	24670	140	32.0	72.0	104.0
278	24670	24790	120	24.0	36.0	60.0
279	24790	24990	200	39.0	36.0	75.0
280	24990	25010	20	39.0	54.0	93.0
281	25010	25090	80	26.0	54.0	80.0
282	25090	25140	50	26.0	72.0	98.0
283	25140	25220	80	52.0	72.0	124.0
284	25220	25360	140	52.0	98.0	150.0
285	25360	25610	250	52.0	103.0	155.0
286	25610	25680	70	52.0	69.0	121.0
287	25680	26210	530	95.0	69.0	164.0
288	26210	26290	80	64.0	69.0	133.0
289	26290	26850	560	64.0	84.0	148.0
290	26850	26980	130	64.0	90.0	154.0
291	26980	27110	130	87.0	90.0	177.0
292	27110	27140	30	87.0	97.0	184.0
293	27140	27220	80	107.0	97.0	204.0
294	27220	27370	150	97.0	79.0	176.0
295	27370	27400	30	62.0	79.0	141.0
296	27400	27610	210	62.0	58.0	120.0
297	27610	27910	300	58.0	58.0	116.0
298	27910	27950	40	30.0	58.0	88.0
299	27950	28030	80	30.0	24.0	54.0
300	28030	28130	100	28.0	28.0	56.0
301	28130	28210	80	40.0	28.0	68.0
302	28210	28230	20	40.0	40.0	80.0
303	28230	28240	10	22.0	40.0	62.0
304	28240	28310	70	22.0	40.0	62.0
305	28310	28350	40	22.0	38.0	60.0
306	28350	28420	70	44.0	38.0	82.0
307	28420	28450	30	44.0	38.0	82.0
308	28450	28510	60	44.0	30.0	74.0



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
309	28510	28570	60	36.0	30.0	66.0
310	28570	28610	40	36.0	54.0	90.0
311	28610	28750	140	42.0	54.0	96.0
312	28750	28830	80	42.0	34.0	76.0
313	28830	28850	20	42.0	34.0	76.0
314	28850	28970	120	38.0	34.0	72.0
315	28970	29020	50	38.0	50.0	88.0
316	29020	29090	70	38.0	50.0	88.0
317	29090	29170	80	30.0	40.0	70.0
318	29170	29210	40	30.0	48.0	78.0
319	29210	29270	60	37.0	48.0	85.0
320	29270	29330	60	37.0	38.0	75.0
321	29330	29390	60	28.0	38.0	66.0
322	29390	29450	60	28.0	28.0	56.0
323	29450	29550	100	36.0	28.0	64.0
324	29550	29650	100	44.0	50.0	94.0
325	29650	29670	20	44.0	50.0	94.0
326	29670	29790	120	44.0	64.0	108.0
327	29790	29810	20	44.0	49.0	93.0
328	29810	29870	60	32.0	49.0	81.0
329	29870	29970	100	32.0	27.0	59.0
330	29970	30060	90	37.0	39.0	76.0
331	30060	30750	690	27.5	27.5	55.0
332	30750	30850	100	37.0	36.0	73.0
333	30850	30980	130	40.0	43.0	83.0
334	30980	31550	570	27.5	27.5	55.0
335	31550	31650	100	30.0	56.0	86.0
336	31650	31710	60	30.0	81.0	111.0
337	31710	31790	80	36.0	81.0	117.0
338	31790	31810	20	36.0	67.0	103.0
339	31810	31970	160	30.0	67.0	97.0
340	31970	32030	60	40.0	67.0	107.0
341	32030	32090	60	40.0	45.0	85.0
342	32090	32110	20	38.0	40.0	78.0
343	32110	32150	40	38.0	40.0	78.0
344	32150	32190	40	38.0	52.0	90.0
345	32190	32310	120	45.0	52.0	97.0



PROW SUMMARY						
S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
346	32310	32330	20	35.0	52.0	87.0
347	32330	32360	30	35.0	37.0	72.0
348	32360	32410	50	35.0	37.0	72.0
349	32410	32450	40	35.0	30.0	65.0
350	32450	32460	10	48.0	30.0	78.0
351	32460	32490	30	48.0	30.0	78.0
352	32490	32590	100	48.0	40.0	88.0
353	32590	32630	40	66.0	40.0	106.0
354	32630	32670	40	66.0	60.0	126.0
355	32670	32730	60	74.0	60.0	134.0
356	32730	32750	20	60.0	60.0	120.0
357	32750	32810	60	60.0	75.0	135.0
358	32810	32850	40	39.0	75.0	114.0
359	32850	32910	60	39.0	82.0	121.0
360	32910	32960	50	65.0	82.0	147.0
361	32960	32990	30	65.0	82.0	147.0
362	32990	33040	50	65.0	61.0	126.0
363	33040	33060	20	30.0	61.0	91.0
364	33060	33100	40	30.0	27.5	57.5
365	33100	33180	80	68.0	27.5	95.5
366	33180	33250	70	68.0	76.0	144.0
367	33250	33350	100	27.5	76.0	103.5
368	33350	33620	270	27.5	27.5	55.0
369	33620	33630	10	24.0	27.5	51.5
370	33630	33710	80	24.0	40.0	64.0
371	33710	33730	20	52.0	40.0	92.0
372	33730	33910	180	52.0	58.0	110.0
373	33910	33970	60	84.0	58.0	142.0
374	33970	34020	50	84.0	73.0	157.0
375	34020	34070	50	46.0	73.0	119.0
376	34070	34080	10	46.0	73.0	119.0
377	34080	34090	10	46.0	60.0	106.0
378	34090	34100	10	48.0	60.0	108.0
379	34100	34110	10	48.0	60.0	108.0
380	34110	34120	10	48.0	60.0	108.0
381	34120	34150	30	48.0	60.0	108.0
382	34150	34160	10	48.0	60.0	108.0



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
383	34160	34170	10	26.0	44.0	70.0
384	34170	34180	10	26.0	44.0	70.0
385	34180	34190	10	26.0	44.0	70.0
386	34190	34200	10	26.0	44.0	70.0
387	34200	34230	30	26.0	44.0	70.0
388	34230	34240	10	26.0	44.0	70.0
389	34240	34250	10	26.0	44.0	70.0
390	34250	34260	10	26.0	44.0	70.0
391	34260	34270	10	26.0	44.0	70.0
392	34270	34280	10	40.0	58.0	98.0
393	34280	34360	80	40.0	58.0	98.0
394	34360	34410	50	40.0	48.0	88.0
395	34410	34460	50	48.0	48.0	96.0
396	34460	34560	100	48.0	30.0	78.0
397	34560	34590	30	34.0	30.0	64.0
398	34590	34640	50	34.0	34.0	68.0
399	34640	34850	210	27.5	27.5	55.0
400	34850	34950	100	48.0	44.0	92.0
401	34950	34960	10	48.0	56.0	104.0
402	34960	35000	40	42.0	56.0	98.0
403	35000	35310	310	27.5	27.5	55.0
404	35310	35320	10	27.5	27.5	55.0
405	35320	35330	10	27.5	27.5	55.0
406	35330	35340	10	27.5	27.5	55.0
407	35340	35350	10	27.5	27.5	55.0
408	35350	35360	10	27.5	27.5	55.0
409	35360	35430	70	27.5	27.5	55.0
410	35430	35440	10	27.5	27.5	55.0
411	35440	35450	10	27.5	27.5	55.0
412	35450	35460	10	27.5	27.5	55.0
413	35460	35470	10	27.5	27.5	55.0
414	35470	35480	10	56.0	58.0	114.0
415	35480	35490	10	56.0	58.0	114.0
416	35490	35500	10	56.0	58.0	114.0
417	35500	35510	10	56.0	58.0	114.0
418	35510	35520	10	56.0	58.0	114.0
419	35520	35530	10	56.0	58.0	114.0

PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
420	35530	35540	10	56.0	58.0	114.0
421	35540	35550	10	56.0	58.0	114.0
422	35550	35560	10	56.0	108.0	164.0
423	35560	35570	10	48.0	108.0	156.0
424	35570	35580	10	48.0	108.0	156.0
425	35580	35590	10	48.0	108.0	156.0
426	35590	35600	10	48.0	108.0	156.0
427	35600	35610	10	48.0	108.0	156.0
428	35610	35620	10	48.0	108.0	156.0
429	35620	35630	10	48.0	108.0	156.0
430	35630	35640	10	48.0	108.0	156.0
431	35640	35650	10	48.0	108.0	156.0
432	35650	35660	10	48.0	108.0	156.0
433	35660	35670	10	48.0	108.0	156.0
434	35670	35680	10	50.0	108.0	158.0
435	35680	35690	10	50.0	28.0	78.0
436	35690	35700	10	50.0	28.0	78.0
437	35700	35710	10	50.0	28.0	78.0
438	35710	35720	10	50.0	28.0	78.0
439	35720	35730	10	50.0	28.0	78.0
440	35730	35740	10	50.0	28.0	78.0
441	35740	35770	30	36.0	28.0	64.0
442	35770	35780	10	36.0	28.0	64.0
443	35780	35790	10	36.0	28.0	64.0
444	35790	35800	10	36.0	34.0	70.0
445	35800	35810	10	36.0	34.0	70.0
446	35810	35820	10	36.0	34.0	70.0
447	35820	35830	10	36.0	34.0	70.0
448	35830	35840	10	36.0	34.0	70.0
449	35840	35850	10	36.0	34.0	70.0
450	35850	35860	10	56.0	34.0	90.0
451	35860	35870	10	56.0	34.0	90.0
452	35870	35880	10	56.0	34.0	90.0
453	35880	35890	10	56.0	30.0	86.0
454	35890	35900	10	56.0	30.0	86.0
455	35900	35940	40	56.0	30.0	86.0
456	35940	35990	50	30.0	30.0	60.0



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
457	35990	36050	60	30.0	44.0	74.0
458	36050	36090	40	38.0	44.0	82.0
459	36090	36150	60	38.0	92.0	130.0
460	36150	36190	40	56.0	92.0	148.0
461	36190	36300	110	56.0	120.0	176.0
462	36300	36330	30	56.0	90.0	146.0
463	36330	36340	10	56.0	90.0	146.0
464	36340	36350	10	56.0	90.0	146.0
465	36350	36360	10	56.0	90.0	146.0
466	36360	36370	10	56.0	90.0	146.0
467	36370	36380	10	56.0	90.0	146.0
468	36380	36390	10	50.0	90.0	140.0
469	36390	36400	10	50.0	90.0	140.0
470	36400	36410	10	50.0	50.0	100.0
471	36410	36420	10	50.0	50.0	100.0
472	36420	36430	10	50.0	50.0	100.0
473	36430	36440	10	50.0	50.0	100.0
474	36440	36450	10	50.0	50.0	100.0
475	36450	36460	10	50.0	50.0	100.0
476	36460	36470	10	50.0	50.0	100.0
477	36470	36480	10	50.0	50.0	100.0
478	36480	36490	10	50.0	50.0	100.0
479	36490	36500	10	50.0	50.0	100.0
480	36500	36510	10	50.0	50.0	100.0
481	36510	36520	10	50.0	50.0	100.0
482	36520	36530	10	50.0	50.0	100.0
483	36530	36540	10	50.0	66.0	116.0
484	36540	36550	10	50.0	66.0	116.0
485	36550	36560	10	50.0	66.0	116.0
486	36560	36570	10	50.0	66.0	116.0
487	36570	36590	20	80.0	66.0	146.0
488	36590	36600	10	80.0	66.0	146.0
489	36600	36610	10	80.0	66.0	146.0
490	36610	36620	10	80.0	66.0	146.0
491	36620	36630	10	80.0	66.0	146.0
492	36630	36640	10	80.0	74.0	154.0
493	36640	36650	10	80.0	74.0	154.0



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
494	36650	36660	10	80.0	74.0	154.0
495	36660	36670	10	80.0	74.0	154.0
496	36670	36680	10	80.0	74.0	154.0
497	36680	36690	10	80.0	74.0	154.0
498	36690	36700	10	80.0	74.0	154.0
499	36700	36710	10	80.0	74.0	154.0
500	36710	36720	10	80.0	74.0	154.0
501	36720	36730	10	66.0	74.0	140.0
502	36730	36740	10	66.0	74.0	140.0
503	36740	36770	30	66.0	40.0	106.0
504	36770	36780	10	66.0	40.0	106.0
505	36780	36790	10	66.0	40.0	106.0
506	36790	36800	10	66.0	40.0	106.0
507	36800	36810	10	66.0	40.0	106.0
508	36810	36820	10	66.0	40.0	106.0
509	36820	36830	10	66.0	28.0	94.0
510	36830	36840	10	66.0	28.0	94.0
511	36840	36850	10	66.0	28.0	94.0
512	36850	36860	10	66.0	28.0	94.0
513	36860	36910	50	76.0	72.0	148.0
514	36910	36950	40	76.0	28.0	104.0
515	36950	37030	80	76.0	34.0	110.0
516	37030	37050	20	54.0	34.0	88.0
517	37050	37060	10	54.0	40.0	94.0
518	37060	37140	80	32.0	40.0	72.0
519	37140	37210	70	32.0	30.0	62.0
520	37210	37220	10	60.0	30.0	90.0
521	37220	37230	10	60.0	30.0	90.0
522	37230	37240	10	60.0	30.0	90.0
523	37240	37250	10	60.0	30.0	90.0
524	37250	37260	10	60.0	34.0	94.0
525	37260	37270	10	60.0	34.0	94.0
526	37270	37280	10	60.0	34.0	94.0
527	37280	37290	10	60.0	34.0	94.0
528	37290	37300	10	60.0	34.0	94.0
529	37300	37310	10	60.0	34.0	94.0
530	37310	37320	10	60.0	34.0	94.0

PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
531	37320	37330	10	60.0	34.0	94.0
532	37330	37340	10	60.0	34.0	94.0
533	37340	37350	10	60.0	34.0	94.0
534	37350	37360	10	60.0	38.0	98.0
535	37360	37370	10	60.0	38.0	98.0
536	37370	37380	10	60.0	38.0	98.0
537	37380	37390	10	60.0	38.0	98.0
538	37390	37400	10	60.0	38.0	98.0
539	37400	37410	10	60.0	38.0	98.0
540	37410	37420	10	60.0	38.0	98.0
541	37420	37430	10	60.0	38.0	98.0
542	37430	37440	10	60.0	38.0	98.0
543	37440	37450	10	60.0	38.0	98.0
544	37450	37460	10	60.0	50.0	110.0
545	37460	37470	10	60.0	50.0	110.0
546	37470	37480	10	86.0	50.0	136.0
547	37480	37490	10	86.0	50.0	136.0
548	37490	37500	10	86.0	50.0	136.0
549	37500	37510	10	86.0	50.0	136.0
550	37510	37520	10	86.0	50.0	136.0
551	37520	37530	10	86.0	50.0	136.0
552	37530	37540	10	86.0	50.0	136.0
553	37540	37550	10	86.0	36.0	122.0
554	37550	37560	10	86.0	36.0	122.0
555	37560	37570	10	86.0	36.0	122.0
556	37570	37580	10	86.0	36.0	122.0
557	37580	37590	10	86.0	36.0	122.0
558	37590	37600	10	86.0	36.0	122.0
559	37600	37610	10	86.0	36.0	122.0
560	37610	37620	10	86.0	36.0	122.0
561	37620	37640	20	86.0	36.0	122.0
562	37640	37650	10	36.0	36.0	72.0
563	37650	37720	70	36.0	64.0	100.0
564	37720	38050	330	27.5	27.5	55.0
565	38050	38110	60	34.0	36.0	70.0
566	38110	38120	10	34.0	36.0	70.0
567	38120	38130	10	34.0	36.0	70.0



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
568	38130	38140	10	34.0	36.0	70.0
569	38140	38150	10	34.0	36.0	70.0
570	38150	38160	10	62.0	46.0	108.0
571	38160	38170	10	62.0	46.0	108.0
572	38170	38180	10	62.0	46.0	108.0
573	38180	38190	10	62.0	46.0	108.0
574	38190	38200	10	62.0	46.0	108.0
575	38200	38210	10	62.0	46.0	108.0
576	38210	38220	10	62.0	46.0	108.0
577	38220	38230	10	62.0	46.0	108.0
578	38230	38240	10	62.0	46.0	108.0
579	38240	38250	10	30.0	46.0	76.0
580	38250	38260	10	30.0	60.0	90.0
581	38260	38270	10	30.0	60.0	90.0
582	38270	38280	10	30.0	60.0	90.0
583	38280	38290	10	30.0	60.0	90.0
584	38290	38300	10	30.0	60.0	90.0
585	38300	38310	10	30.0	60.0	90.0
586	38310	38320	10	30.0	60.0	90.0
587	38320	38330	10	30.0	60.0	90.0
588	38330	38340	10	30.0	60.0	90.0
589	38340	38350	10	30.0	54.0	84.0
590	38350	38360	10	30.0	54.0	84.0
591	38360	38370	10	30.0	54.0	84.0
592	38370	38380	10	30.0	54.0	84.0
593	38380	38390	10	30.0	54.0	84.0
594	38390	38400	10	30.0	54.0	84.0
595	38400	38420	20	30.0	54.0	84.0
596	38420	38660	240	30.0	30.0	60.0
597	38660	38750	90	35.0	30.0	65.0
598	38750	38760	10	55.0	30.0	85.0
599	38760	38810	50	55.0	25.0	80.0
600	38810	38880	70	63.0	25.0	88.0
601	38880	38970	90	53.0	25.0	78.0
602	38970	38980	10	53.0	27.5	80.5
603	38980	39360	380	27.5	27.5	55.0
604	39360	39380	20	27.5	60.0	87.5



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
605	39380	39400	20	36.0	60.0	96.0
606	39400	39460	60	36.0	28.0	64.0
607	39460	39480	20	61.0	28.0	89.0
608	39480	39540	60	61.0	36.0	97.0
609	39540	39590	50	61.0	27.5	88.5
610	39590	39800	210	27.5	27.5	55.0
611	39800	39860	60	27.5	37.0	64.5
612	39860	39900	40	27.5	56.0	83.5
613	39900	40030	130	35.0	56.0	91.0
614	40030	40060	30	40.0	56.0	96.0
615	40060	40070	10	40.0	27.5	67.5
616	40070	40180	110	27.5	27.5	55.0
617	40180	40200	20	27.5	30.0	57.5
618	40200	40260	60	35.0	30.0	65.0
619	40260	40280	20	35.0	27.5	62.5
620	40280	40520	240	27.5	27.5	55.0
621	40520	40620	100	22.0	44.0	66.0
622	40620	40640	20	27.5	44.0	71.5
623	40640	40650	10	27.5	100.0	127.5
624	40650	40710	60	75.0	100.0	175.0
625	40710	40860	150	27.5	100.0	127.5
626	40860	40870	10	57.0	100.0	157.0
627	40870	40890	20	57.0	38.0	95.0
628	40890	40970	80	57.0	49.0	106.0
629	40970	41080	110	44.0	49.0	93.0
630	41080	41160	80	44.0	38.0	82.0
631	41160	41240	80	52.0	38.0	90.0
632	41240	41260	20	29.0	38.0	67.0
633	41260	41360	100	29.0	42.0	71.0
634	41360	41440	80	29.0	35.0	64.0
635	41440	41460	20	65.0	35.0	100.0
636	41460	41570	110	65.0	55.0	120.0
637	41570	41580	10	75.0	55.0	130.0
638	41580	41600	20	75.0	34.0	109.0
639	41600	41680	80	45.0	34.0	79.0
640	41680	41690	10	45.0	53.0	98.0
641	41690	41780	90	53.0	53.0	106.0



PROW SUMMARY

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
642	41780	41940	160	66.0	54.0	120.0
643	41940	41960	20	32.0	54.0	86.0
644	41960	42060	100	32.0	40.0	72.0
645	42060	42080	20	56.0	40.0	96.0
646	42080	42210	130	55.0	50.0	105.0
647	42210	42320	110	90.0	63.0	153.0
648	42320	42340	20	90.0	100.0	190.0
649	42340	42450	110	73.0	100.0	173.0
650	42450	42600	150	94.0	100.0	194.0
651	42600	42650	50	36.0	100.0	136.0
652	42650	42690	40	65.0	100.0	165.0
653	42690	42760	70	36.0	43.0	79.0
654	42760	42810	50	36.0	30.0	66.0
655	42810	42820	10	36.0	30.0	66.0
656	42820	42830	10	36.0	30.0	66.0
657	42830	42840	10	36.0	30.0	66.0
658	42840	42850	10	36.0	30.0	66.0
659	42850	42860	10	36.0	30.0	66.0
660	42860	42870	10	36.0	30.0	66.0
661	42870	42880	10	36.0	30.0	66.0
662	42880	42890	10	36.0	30.0	66.0
663	42890	42900	10	36.0	30.0	66.0
664	42900	42910	10	36.0	30.0	66.0
665	42910	42920	10	36.0	30.0	66.0
666	42920	42930	10	36.0	30.0	66.0
667	42930	43110	180	27.5	27.5	55.0
668	43110	43230	120	60.0	54.0	114.0
669	43230	43280	50	60.0	90.0	150.0
670	43280	43380	100	48.0	90.0	138.0
671	43380	43410	30	48.0	45.0	93.0
672	43410	43570	160	57.0	45.0	102.0
673	43570	43620	50	57.0	56.0	113.0
674	43620	43750	130	48.0	56.0	104.0
675	43750	43850	100	48.0	54.0	102.0
676	43850	44040	190	65.0	54.0	119.0
677	44040	44110	70	65.0	63.0	128.0
678	44110	44140	30	50.0	63.0	113.0

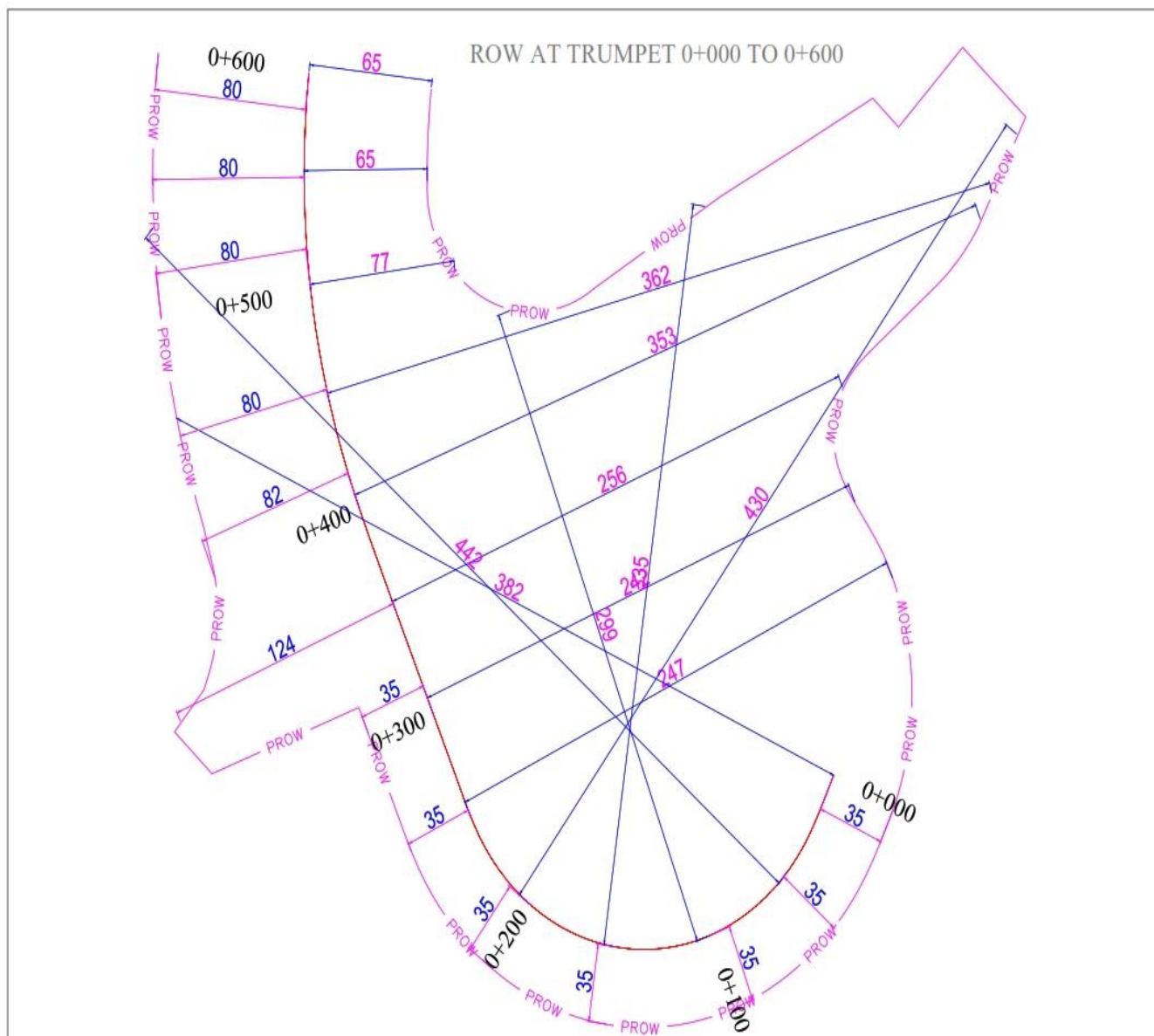
PROW SUMMARY						
S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
679	44140	44290	150	50.0	55.0	105.0
680	44290	44410	120	72.0	55.0	127.0
681	44410	44460	50	72.0	73.0	145.0
682	44460	44550	90	65.0	73.0	138.0
683	44550	44690	140	65.0	66.0	131.0
684	44690	44740	50	65.0	69.0	134.0
685	44740	44780	40	83.0	69.0	152.0
686	44780	45010	230	83.0	89.0	172.0
687	45010	45120	110	83.0	82.0	165.0
688	45120	45190	70	67.0	82.0	149.0
689	45190	45210	20	67.0	65.0	132.0
690	45210	45260	50	55.0	65.0	120.0
691	45260	45310	50	55.0	47.0	102.0
692	45310	45340	30	40.0	47.0	87.0
693	45340	45460	120	40.0	39.0	79.0
694	45460	45610	150	36.0	39.0	75.0
695	45610	45620	10	36.0	38.0	74.0
696	45620	45645	25	30.0	38.0	68.0

Table 6.4: Interchanges of Proposed Right of Way (ROW)

INTERCHANGE @0+000 Km

Design Chainage	ROW Width (m)		Total Width (m)
	Left	Right	
0	35	382	417
50	35	442	477
100	35	300	335
150	35	335	370
200	35	430	465
250	35	247	282
300	35	242	277
350	124	256	380
400	82	353	435

Design Chainage	ROW Width (m)		Total Width (m)
	Left	Right	
450	80	362	442
500	80	77	157
550	80	65	145
600	80	65	145



INTERCHANGE @12+700 Km Connecting Road HSC to Ex. NH-06

Sr. No.	Design Chainage		Length (m)	ROW WIDTH		Total Width (m)
	From	To		LHS ROW	RHS ROW	
1	0	300	300	16	16	32

INTERCHANGE @27+200 Km Ex. NH-06 Road PROW

S. No.	Design Chainage (m)		Length (m)	Row Width (m)		Total Width (m)
	From	To		Left	Right	
1	0	350	350	17	17	34
2	350	420	70	30	30	60
3	580	690	110	40	40	80
4	690	850	160	25	25	50
5	850	1081	231	17	17	34

EX. 4 Lane Under Construction Road PROW @Ch. 44+935 Km

Sr. No.	Design Chainage		ROW WIDTH		Total Width (m)
	From	To	LHS ROW	RHS ROW	
1	0	300	27.5	27.5	55
2	470	905	27.5	27.5	55

Additional PROW for development of Existing Road @Ch. 6+400 Km

Sr. No.	Design Chainage	ROW WIDTH	
		LHS ROW	RHS ROW
1	560	31.79	10.00
2	570	32.42	10.00
3	580	32.57	10.00
4	590	32.25	10.00
5	600	31.46	10.00
6	610	30.19	16.27
7	620	28.42	16.31
8	630	26.16	15.30
9	640	23.38	13.20
10	650	20.34	10.29
11	660	17.52	8.43
12	670	14.55	7.20



Sr. No.	Design Chainage	ROW WIDTH	
		LHS ROW	RHS ROW
13	680	11.57	6.60
14	690	8.76	6.62
15	700	7.00	7.00
16	710	7.00	7.00
17	720	7.00	7.00
18	730	7.00	7.00
19	740	7.00	7.00
20	750	7.00	7.00
21	760	7.00	7.00
22	770	7.00	7.00
23	780	7.00	7.00
24	790	7.00	7.00
25	800	7.00	7.00

6.4 Cross Section Details

The Project Highway shall involve the new construction of a four-lane configuration with paved shoulders in greenfield alignment. It will be a controlled-access facility, with entry and exit points strategically limited to prevent congestion and ensure a high-speed corridor. Service roads will be provided at selected locations. Typical cross sections required to be developed in different sections of the Project Highway are given below.

Typical Cross section for the project road section has been provided in the Appendix-IV.

Table 6.5: Typical Cross-sections Detail Chainage Wise

Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
1	0.000	0.100	0.100	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
2	0.100	0.140	0.040	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
3	0.140	0.410	0.270	VUP cum Viaduct	VUP cum Viaduct
4	0.410	0.460	0.050	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
5	0.460	0.500	0.040	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
6	0.500	0.520	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
7	0.520	0.540	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
8	0.540	0.580	0.040	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
9	0.580	0.600	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
10	0.600	1.020	0.420	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
11	1.020	1.040	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
12	1.040	1.080	0.040	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
13	1.080	1.100	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
14	1.100	1.120	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
15	1.120	1.220	0.100	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
16	1.220	1.240	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
17	1.240	1.260	0.020	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
18	1.260	1.300	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
19	1.300	1.320	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
20	1.320	1.440	0.120	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
21	1.440	1.460	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
22	1.460	1.480	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
23	1.480	1.505	0.025	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
24	1.505	1.515	0.010	Viaduct	Viaduct
25	1.515	1.540	0.025	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
26	1.540	1.580	0.040	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
27	1.580	1.600	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
28	1.600	1.660	0.060	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
29	1.660	1.680	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
30	1.680	1.690	0.010	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
31	1.690	1.850	0.160	Viaduct	Viaduct
32	1.850	1.880	0.030	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
33	1.880	1.900	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
34	1.900	2.260	0.360	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
35	2.260	2.280	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
36	2.280	2.420	0.140	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
37	2.420	2.440	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
38	2.440	2.460	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
39	2.460	2.560	0.100	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
40	2.560	2.640	0.080	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
41	2.640	2.660	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
42	2.660	2.700	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
43	2.700	2.840	0.140	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
44	2.840	2.860	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
45	2.860	2.960	0.100	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
46	2.960	2.980	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
47	2.980	3.020	0.040	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
48	3.020	3.030	0.010	MNB	Minor Bridge
49	3.030	3.060	0.030	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
50	3.060	3.080	0.020	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
51	3.080	3.140	0.060	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
52	3.140	3.180	0.040	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
53	3.180	3.220	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
54	3.220	3.240	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
55	3.240	3.260	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
56	3.260	3.280	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
57	3.280	3.480	0.200	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
58	3.480	3.500	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
59	3.500	3.520	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
60	3.520	3.540	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
61	3.540	3.680	0.140	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
62	3.680	3.800	0.120	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
63	3.800	3.820	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
64	3.820	3.860	0.040	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
65	3.860	3.900	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
66	3.900	4.280	0.380	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
67	4.280	4.300	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
68	4.300	4.320	0.020	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
69	4.320	4.350	0.030	Viaduct	Viaduct

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
70	4.350	4.480	0.130	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
71	4.480	4.540	0.060	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
72	4.540	4.550	0.010	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
73	4.550	4.590	0.040	Viaduct	Viaduct
74	4.590	4.620	0.030	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
75	4.620	4.680	0.060	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
76	4.680	4.720	0.040	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
77	4.720	4.870	0.150	Viaduct	Viaduct
78	4.870	4.940	0.070	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
79	4.940	4.980	0.040	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
80	4.980	5.020	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
81	5.020	5.340	0.320	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
82	5.340	5.360	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
83	5.360	5.380	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
84	5.380	5.400	0.020	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
85	5.400	5.440	0.040	Viaduct	Viaduct
86	5.440	5.480	0.040	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
87	5.480	5.540	0.060	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
88	5.540	5.560	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
89	5.560	5.580	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
90	5.580	5.630	0.050	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
91	5.630	5.650	0.020	Viaduct	Viaduct
92	5.650	5.680	0.030	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
93	5.680	5.700	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
94	5.700	5.760	0.060	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
95	5.760	5.800	0.040	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
96	5.800	5.820	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section



Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
97	5.820	5.840	0.020	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
98	5.840	6.060	0.220	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
99	6.060	6.100	0.040	Viaduct	Viaduct
100	6.100	6.120	0.020	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
101	6.120	6.160	0.040	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
102	6.160	6.180	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
103	6.180	6.200	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
104	6.200	6.360	0.160	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
105	6.360	6.440	0.080	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
106	6.440	7.220	0.780	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
107	7.220	7.263	0.043	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
108	7.263	7.277	0.014	MNB	Minor Bridge
109	7.277	7.300	0.023	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
110	7.300	7.420	0.120	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
111	7.420	7.480	0.060	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
112	7.480	7.500	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
113	7.500	7.520	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
114	7.520	7.540	0.020	TCS-2A	6 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
115	7.540	7.560	0.020	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
116	7.560	7.580	0.020	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
117	7.580	7.600	0.020	TCS-2A	6 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
118	7.600	7.640	0.040	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
119	7.640	7.680	0.040	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
120	7.680	7.696	0.016	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
121	7.696	7.704	0.008	SVUP	SVUP
122	7.704	7.760	0.056	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
123	7.760	7.780	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
124	7.780	7.800	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
125	7.800	7.826	0.026	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
126	7.826	8.665	0.839	Viaduct	Viaduct
127	8.665	8.800	0.135	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
128	8.800	8.820	0.020	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
129	8.820	8.950	0.130	Viaduct	Viaduct
130	8.950	9.020	0.070	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
131	9.020	9.065	0.045	Viaduct	Viaduct
132	9.065	9.100	0.035	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
133	9.100	9.205	0.105	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
134	9.205	9.250	0.045	Viaduct	Viaduct
135	9.250	9.300	0.050	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
136	9.300	9.340	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
137	9.340	9.360	0.020	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
138	9.360	9.380	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
139	9.380	9.400	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
140	9.400	9.420	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
141	9.420	9.440	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
142	9.440	9.820	0.380	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
143	9.820	9.860	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
144	9.860	10.140	0.280	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
145	10.140	10.220	0.080	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
146	10.220	10.265	0.045	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
147	10.265	10.275	0.010	SVUP	SVUP
148	10.275	10.320	0.045	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
149	10.320	10.420	0.100	Viaduct	Viaduct
150	10.420	10.500	0.080	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
151	10.500	10.520	0.020	TCS-2A	6 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
152	10.520	10.540	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section



Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
153	10.540	10.560	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
154	10.560	10.575	0.015	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
155	10.575	10.585	0.010	Viaduct	Viaduct
156	10.585	10.640	0.055	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
157	10.640	10.840	0.200	TCS-14	4 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
158	10.840	11.140	0.300	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
159	11.140	11.180	0.040	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
160	11.180	11.189	0.009	SVUP	SVUP
161	11.189	11.260	0.071	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
162	11.260	11.300	0.040	TCS-14	4 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
163	11.300	11.320	0.020	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
164	11.320	11.400	0.080	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
165	11.400	11.760	0.360	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
166	11.760	11.854	0.094	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
167	11.854	11.866	0.012	LVUP	LVUP
168	11.866	11.940	0.074	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
169	11.940	12.100	0.160	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
170	12.100	12.160	0.060	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
171	12.160	12.220	0.060	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
172	12.220	12.271	0.051	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
173	12.271	12.279	0.008	SVUP	SVUP
174	12.279	12.400	0.121	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
175	12.400	12.480	0.080	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
176	12.480	12.500	0.020	MNB	Minor Bridge
177	12.500	12.683	0.183	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
178	12.683	12.717	0.034	VUP	VUP
179	12.717	12.880	0.163	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
180	12.880	13.000	0.120	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
181	13.000	13.120	0.120	MJB	Major Bridge
182	13.120	13.160	0.040	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
183	13.160	13.180	0.020	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
184	13.180	13.220	0.040	VUP	VUP
185	13.220	13.380	0.160	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road



Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
186	13.380	13.390	0.010	SVUP	SVUP
187	13.390	13.440	0.050	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
188	13.440	13.520	0.080	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
189	13.520	13.540	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
190	13.540	13.720	0.180	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
191	13.720	13.740	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
192	13.740	13.760	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
193	13.760	13.840	0.080	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
194	13.840	13.860	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
195	13.860	13.880	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
196	13.880	14.160	0.280	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
197	14.160	14.180	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
198	14.180	14.240	0.060	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
199	14.240	14.260	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
200	14.260	14.280	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
201	14.280	14.400	0.120	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
202	14.400	14.420	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
203	14.420	14.440	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
204	14.440	14.540	0.100	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
205	14.540	14.716	0.176	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
206	14.716	14.724	0.008	SVUP	SVUP
207	14.724	14.860	0.136	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
208	14.860	15.220	0.360	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
209	15.220	15.240	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
210	15.240	15.540	0.300	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
211	15.540	15.690	0.150	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
212	15.690	15.710	0.020	VUP	VUP
213	15.710	15.800	0.090	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
214	15.800	15.840	0.040	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
215	15.840	15.860	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
216	15.860	15.880	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
217	15.880	15.940	0.060	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
218	15.940	16.000	0.060	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
219	16.000	16.020	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
220	16.020	16.220	0.200	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
221	16.220	16.340	0.120	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
222	16.340	16.380	0.040	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
223	16.380	16.460	0.080	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
224	16.460	16.520	0.060	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
225	16.520	16.540	0.020	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
226	16.540	16.620	0.080	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
227	16.620	16.760	0.140	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
228	16.760	16.780	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
229	16.780	16.880	0.100	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
230	16.880	16.900	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
231	16.900	17.060	0.160	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
232	17.060	17.140	0.080	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
233	17.140	17.180	0.040	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
234	17.180	17.356	0.176	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
235	17.356	17.364	0.008	SVUP	SVUP
236	17.364	17.400	0.036	TCS-2A	6 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
237	17.400	17.420	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
238	17.420	17.500	0.080	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
239	17.500	17.760	0.260	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
240	17.760	17.840	0.080	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
241	17.840	17.880	0.040	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
242	17.880	17.900	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
243	17.900	17.920	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
244	17.920	17.940	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
245	17.940	17.960	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
246	17.960	17.980	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
247	17.980	18.000	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
248	18.000	18.020	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
249	18.020	18.060	0.040	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
250	18.060	18.080	0.020	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
251	18.080	18.100	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
252	18.100	18.140	0.040	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
253	18.140	18.160	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
254	18.160	18.180	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
255	18.180	18.220	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
256	18.220	18.860	0.640	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
257	18.860	18.880	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
258	18.880	18.900	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
259	18.900	18.920	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
260	18.920	18.940	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
261	18.940	18.980	0.040	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
262	18.980	19.000	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
263	19.000	19.080	0.080	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction

Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
264	19.080	19.120	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
265	19.120	19.140	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
266	19.140	19.240	0.100	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
267	19.240	19.260	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
268	19.260	19.380	0.120	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
269	19.380	19.400	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
270	19.400	19.420	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
271	19.420	19.440	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
272	19.440	19.460	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
273	19.460	19.500	0.040	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
274	19.500	19.520	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
275	19.520	19.540	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
276	19.540	19.640	0.100	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
277	19.640	19.660	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
278	19.660	19.680	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
279	19.680	19.700	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
280	19.700	19.720	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
281	19.720	19.740	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
282	19.740	19.760	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
283	19.760	19.780	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
284	19.780	19.820	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
285	19.820	19.840	0.020	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
286	19.840	19.860	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
287	19.860	19.880	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section



Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
288	19.880	19.920	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
289	19.920	19.940	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
290	19.940	19.960	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
291	19.960	19.980	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
292	19.980	20.040	0.060	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
293	20.040	20.080	0.040	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
294	20.080	20.120	0.040	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
295	20.120	20.140	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
296	20.140	20.260	0.120	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
297	20.260	20.300	0.040	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
298	20.300	20.326	0.026	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
299	20.326	20.334	0.008	SVUP	SVUP
300	20.334	20.536	0.202	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
301	20.536	20.560	0.024	MNB	Minor Bridge
302	20.560	20.640	0.080	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
303	20.640	20.920	0.280	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
304	20.920	20.960	0.040	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
305	20.960	20.980	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
306	20.980	21.140	0.160	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
307	21.140	21.160	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
308	21.160	21.180	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
309	21.180	21.200	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
310	21.200	21.300	0.100	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
311	21.300	21.320	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
312	21.320	21.345	0.025	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
313	21.345	21.410	0.065	VUP	VUP
314	21.410	21.440	0.030	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
315	21.440	21.460	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
316	21.460	21.500	0.040	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
317	21.500	21.520	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
318	21.520	21.560	0.040	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
319	21.560	21.580	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
320	21.580	21.620	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
321	21.620	21.640	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
322	21.640	21.660	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
323	21.660	21.680	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
324	21.680	21.720	0.040	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
325	21.720	21.740	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
326	21.740	21.760	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
327	21.760	21.780	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
328	21.780	21.820	0.040	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
329	21.820	21.920	0.100	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
330	21.920	21.940	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
331	21.940	21.980	0.040	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
332	21.980	22.000	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
333	22.000	22.020	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
334	22.020	22.100	0.080	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
335	22.100	22.120	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
336	22.120	22.640	0.520	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
337	22.640	22.660	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
338	22.660	22.700	0.040	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
339	22.700	22.740	0.040	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
340	22.740	22.760	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
341	22.760	22.780	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
342	22.780	22.840	0.060	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
343	22.840	22.860	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
344	22.860	22.900	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
345	22.900	22.920	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
346	22.920	22.960	0.040	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
347	22.960	22.980	0.020	Viaduct	Viaduct
348	22.980	23.040	0.060	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
349	23.040	23.060	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
350	23.060	23.100	0.040	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
351	23.100	23.160	0.060	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
352	23.160	23.180	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
353	23.180	23.200	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
354	23.200	23.220	0.020	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
355	23.220	23.380	0.160	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
356	23.380	23.415	0.035	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
357	23.415	23.425	0.010	Viaduct	Viaduct
358	23.425	23.460	0.035	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
359	23.460	23.480	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
360	23.480	23.500	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
361	23.500	23.520	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
362	23.520	23.540	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
363	23.540	23.560	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
364	23.560	23.760	0.200	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
365	23.760	23.780	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
366	23.780	23.820	0.040	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
367	23.820	23.900	0.080	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
368	23.900	23.920	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
369	23.920	23.940	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
370	23.940	24.060	0.120	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
371	24.060	24.120	0.060	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
372	24.120	24.200	0.080	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
373	24.200	24.220	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
374	24.220	24.260	0.040	TCS-6	4 - Lane Divided Highway (One side Filling <3m,One side Filling 3m to 7m) New Construction
375	24.260	24.310	0.050	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
376	24.310	24.330	0.020	MNB	Minor Bridge
377	24.330	24.360	0.030	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
378	24.360	24.400	0.040	TCS-6	4 - Lane Divided Highway (One side Filling <3m,One side Filling 3m to 7m) New Construction
379	24.400	24.420	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
380	24.420	24.440	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
381	24.440	24.480	0.040	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
382	24.480	24.500	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m,One side Filling 3m to 7m) New Construction
383	24.500	24.540	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
384	24.540	24.680	0.140	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
385	24.680	24.700	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
386	24.700	24.720	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
387	24.720	24.740	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
388	24.740	24.775	0.035	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
389	24.775	24.785	0.010	MNB	Minor Bridge
390	24.785	24.810	0.025	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
391	24.810	24.820	0.010	MNB	Minor Bridge
392	24.820	24.880	0.060	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
393	24.880	24.960	0.080	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
394	24.960	24.980	0.020	TCS-2A	6 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
395	24.980	25.040	0.060	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
396	25.040	25.060	0.020	TCS-2A	6 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
397	25.060	25.100	0.040	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
398	25.100	25.140	0.040	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
399	25.140	25.185	0.045	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
400	25.185	25.300	0.115	Viaduct	Viaduct
401	25.300	25.528	0.228	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
402	25.528	25.563	0.035	VUP	VUP
403	25.563	25.580	0.017	TCS-3A	6 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
404	25.580	25.600	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
405	25.600	26.940	1.340	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
406	26.940	26.960	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
407	26.960	27.000	0.040	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
408	27.000	27.020	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
409	27.020	27.940	0.920	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
410	27.940	28.040	0.100	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
411	28.040	28.060	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
412	28.060	28.100	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
413	28.100	28.140	0.040	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
414	28.140	28.180	0.040	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
415	28.180	28.200	0.020	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
416	28.200	28.280	0.080	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
417	28.280	28.320	0.040	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction



Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
418	28.320	28.340	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
419	28.340	28.360	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
420	28.360	28.480	0.120	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
421	28.480	28.500	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
422	28.500	28.540	0.040	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
423	28.540	28.560	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
424	28.560	28.820	0.260	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
425	28.820	28.840	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
426	28.840	28.860	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
427	28.860	28.900	0.040	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
428	28.900	28.940	0.040	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
429	28.940	28.960	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
430	28.960	28.980	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
431	28.980	29.100	0.120	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
432	29.100	29.160	0.060	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
433	29.160	29.320	0.160	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
434	29.320	29.340	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
435	29.340	29.380	0.040	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
436	29.380	29.400	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
437	29.400	29.420	0.020	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
438	29.420	29.480	0.060	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
439	29.480	29.500	0.020	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
440	29.500	29.520	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
441	29.520	29.540	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
442	29.540	29.560	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
443	29.560	29.580	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
444	29.580	29.600	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
445	29.600	29.620	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
446	29.620	29.640	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
447	29.640	29.880	0.240	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
448	29.880	29.900	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
449	29.900	29.940	0.040	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
450	29.940	30.020	0.080	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
451	30.020	30.040	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
452	30.040	30.060	0.020	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
453	30.060	30.243	0.183	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
454	30.243	30.251	0.008	SVUP	SVUP
455	30.251	30.460	0.209	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
456	30.460	30.470	0.010	SVUP	SVUP
457	30.470	30.660	0.190	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
458	30.660	30.710	0.050	Utility Underpass	Utility Underpass
459	30.710	30.740	0.030	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
460	30.740	30.760	0.020	TCS-1A	6 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
461	30.760	30.960	0.200	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
462	30.960	30.980	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
463	30.980	31.000	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
464	31.000	31.020	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
465	31.020	31.040	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
466	31.040	31.200	0.160	TCS-14	4 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
467	31.200	31.240	0.040	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
468	31.240	31.300	0.060	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
469	31.300	31.360	0.060	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
470	31.360	31.460	0.100	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
471	31.460	31.496	0.036	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
472	31.496	31.504	0.008	SVUP	SVUP
473	31.504	31.540	0.036	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
474	31.540	31.560	0.020	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
475	31.560	31.580	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
476	31.580	31.620	0.040	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
477	31.620	32.340	0.720	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
478	32.340	32.360	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
479	32.360	33.040	0.680	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
480	33.040	33.060	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
481	33.060	33.080	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
482	33.080	33.095	0.015	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
483	33.095	33.105	0.010	MNB	Minor Bridge
484	33.105	33.160	0.055	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
485	33.160	33.195	0.035	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
486	33.195	33.225	0.030	Utility Underpass	Utility Underpass
487	33.225	33.250	0.025	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
488	33.250	33.570	0.320	MJB cum Viaduct	Major Bridge cum Viaduct
489	33.570	33.600	0.030	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
490	33.600	33.620	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
491	33.620	33.640	0.020	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
492	33.640	33.700	0.060	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
493	33.700	34.140	0.440	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
494	34.140	34.160	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
495	34.160	34.180	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
496	34.180	34.200	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction



Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
497	34.200	34.260	0.060	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
498	34.260	34.460	0.200	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
499	34.460	34.500	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
500	34.500	34.540	0.040	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
501	34.540	34.580	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
502	34.580	34.600	0.020	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
503	34.600	34.620	0.020	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
504	34.620	34.820	0.200	Viaduct	Viaduct
505	34.820	34.840	0.020	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
506	34.840	34.860	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
507	34.860	34.940	0.080	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
508	34.940	34.960	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
509	34.960	35.006	0.046	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
510	35.006	35.454	0.448	MJB cum Viaduct	Major Bridge cum Viaduct
511	35.454	35.480	0.026	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
512	35.480	35.500	0.020	TCS-1A	6 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
513	35.500	35.700	0.200	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
514	35.700	35.800	0.100	Viaduct	Viaduct
515	35.800	35.820	0.020	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
516	35.820	35.840	0.020	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
517	35.840	35.880	0.040	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
518	35.880	35.900	0.020	TCS-3	4 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
519	35.900	35.920	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
520	35.920	35.960	0.040	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
521	35.960	35.980	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
522	35.980	36.000	0.020	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
523	36.000	36.020	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
524	36.020	36.040	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
525	36.040	36.820	0.780	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
526	36.820	36.840	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
527	36.840	36.865	0.025	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
528	36.865	36.895	0.030	Utility Underpass	Utility Underpass
529	36.895	36.920	0.025	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
530	36.920	36.940	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
531	36.940	37.080	0.140	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
532	37.080	37.100	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
533	37.100	37.130	0.030	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
534	37.130	37.150	0.020	Viaduct	Viaduct
535	37.150	37.200	0.050	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
536	37.200	37.240	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
537	37.240	37.320	0.080	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
538	37.320	37.360	0.040	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
539	37.360	37.400	0.040	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
540	37.400	37.420	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
541	37.420	37.540	0.120	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
542	37.540	37.560	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
543	37.560	37.600	0.040	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
544	37.600	37.620	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
545	37.620	37.640	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
546	37.640	37.680	0.040	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
547	37.680	37.705	0.025	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
548	37.705	38.026	0.321	MJB cum Viaduct	Major Bridge cum Viaduct
549	38.026	38.060	0.034	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
550	38.060	38.080	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
551	38.080	38.100	0.020	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
552	38.100	38.220	0.120	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
553	38.220	38.240	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
554	38.240	38.260	0.020	TCS-3A	6 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
555	38.260	38.280	0.020	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
556	38.280	38.300	0.020	TCS-3A	6 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
557	38.300	38.320	0.020	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
558	38.320	38.340	0.020	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
559	38.340	38.360	0.020	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
560	38.360	38.380	0.020	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
561	38.380	38.620	0.240	Viaduct	Viaduct
562	38.620	38.640	0.020	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
563	38.640	38.660	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
564	38.660	38.960	0.300	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
565	38.960	39.000	0.040	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
566	39.000	39.240	0.240	Viaduct	Viaduct
567	39.240	39.320	0.080	TCS-17	6- Lane Divided Highway for MNB/MJB Approach Road
568	39.320	39.340	0.020	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
569	39.340	39.360	0.020	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
570	39.360	39.380	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
571	39.380	39.400	0.020	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
572	39.400	39.420	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
573	39.420	39.580	0.160	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
574	39.580	39.600	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
575	39.600	39.620	0.020	LVUP	LVUP
576	39.620	39.635	0.015	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
577	39.635	39.645	0.010	MNB	Minor Bridge



Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
578	39.645	39.700	0.055	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
579	39.700	39.720	0.020	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
580	39.720	39.740	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
581	39.740	40.000	0.260	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
582	40.000	40.020	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
583	40.020	40.040	0.020	TCS-9A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
584	40.040	40.060	0.020	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
585	40.060	40.080	0.020	TCS-2A	6 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
586	40.080	40.105	0.025	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
587	40.105	40.150	0.045	Viaduct	Viaduct
588	40.150	40.180	0.030	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
589	40.180	40.200	0.020	TCS-1A	6 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
590	40.200	40.220	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
591	40.220	40.240	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
592	40.240	40.260	0.020	TCS-7A	6 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
593	40.260	40.280	0.020	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
594	40.280	40.335	0.055	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
595	40.335	40.345	0.010	Viaduct	Viaduct
596	40.345	40.435	0.090	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
597	40.435	40.445	0.010	Viaduct	Viaduct
598	40.445	40.480	0.035	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
599	40.480	40.520	0.040	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
600	40.520	40.540	0.020	TCS-3A	6 - Lane Divided Highway (Partial F 3m to 7m, C<3m) New Construction Section
601	40.540	40.560	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
602	40.560	40.620	0.060	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
603	40.620	40.640	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction



Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
604	40.640	40.650	0.010	TCS-2A	6 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
605	40.650	40.700	0.050	Utility Underpass	Utility Underpass
606	40.700	40.720	0.020	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
607	40.720	40.740	0.020	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
608	40.740	40.780	0.040	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
609	40.780	40.800	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
610	40.800	40.820	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
611	40.820	40.840	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
612	40.840	40.865	0.025	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
613	40.865	40.875	0.010	Viaduct	Viaduct
614	40.875	40.940	0.065	TCS-13A	6 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
615	40.940	41.020	0.080	TCS-13	4 - Lane Divided Highway (One Breast wall & One Retaining wall) New Construction
616	41.020	41.100	0.080	TCS-9	4 - Lane Divided Highway with Breast wall on one side (One side Cutting 3m to 7m) New Construction Section
617	41.100	41.120	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
618	41.120	41.240	0.120	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
619	41.240	41.273	0.033	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
620	41.273	41.288	0.015	MNB	Minor Bridge
621	41.288	41.340	0.052	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
622	41.340	41.400	0.060	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
623	41.400	41.420	0.020	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
624	41.420	41.440	0.020	TCS-8A	6 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
625	41.440	41.620	0.180	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
626	41.620	41.640	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
627	41.640	41.660	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
628	41.660	41.980	0.320	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
629	41.980	42.020	0.040	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New



Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
					Construction Section
630	42.020	42.040	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
631	42.040	42.060	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
632	42.060	42.080	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
633	42.080	42.600	0.520	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
634	42.600	42.620	0.020	TCS-10A	6 - Lane Divided Highway (Both sides Breast wall) New Construction
635	42.620	42.645	0.025	TCS-2A	6 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
636	42.645	42.675	0.030	Utility Underpass	Utility Underpass
637	42.675	42.700	0.025	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
638	42.700	42.720	0.020	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
639	42.720	42.743	0.023	TCS-2A	6 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
640	42.743	42.763	0.020	MNB	Minor Bridge
641	42.763	42.780	0.017	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
642	42.780	42.800	0.020	TCS-6A	6 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
643	42.800	42.820	0.020	TCS-5A	6 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
644	42.820	42.920	0.100	TCS-11A	6 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
645	42.920	42.980	0.060	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
646	42.980	43.100	0.120	Viaduct	Viaduct
647	43.100	43.140	0.040	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
648	43.140	43.160	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
649	43.160	43.380	0.220	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
650	43.380	43.400	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
651	43.400	43.420	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
652	43.420	43.520	0.100	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
653	43.520	43.540	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
654	43.540	43.580	0.040	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Sr. No.	Design Chainage From	Design Chainage To	Length (Km)	TCS Type	TCS Description
655	43.580	43.600	0.020	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
656	43.600	43.680	0.080	TCS-5	4 - Lane Divided Highway (Filling Height 3m to 7m) New Construction Section
657	43.680	43.700	0.020	TCS-11	4 - Lane Divided Highway (One side Retaining Wall, One side filling 3m to 7m) New Construction
658	43.700	43.740	0.040	TCS-6	4 - Lane Divided Highway (One side Filling <3m, One side Filling 3m to 7m) New Construction
659	43.740	43.780	0.040	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
660	43.780	43.820	0.040	MNB	Minor Bridge
661	43.820	43.860	0.040	TCS-14A	6 - Lane Divided Highway (Both side Retaining wall in high Emb.) New Construction
662	43.860	43.880	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
663	43.880	43.900	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
664	43.900	44.020	0.120	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
665	44.020	44.040	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
666	44.040	44.060	0.020	TCS-4	4 - Lane Divided Highway (Filling Height <3m) New Construction Section
667	44.060	44.080	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
668	44.080	44.100	0.020	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
669	44.100	44.380	0.280	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
670	44.380	44.400	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
671	44.400	44.420	0.020	TCS-2	4 - Lane Divided Highway (Partial Cut/Fill <3m) New Construction Section
672	44.420	44.440	0.020	TCS-1	4 - Lane Divided Highway Cutting Section (Cutting Height < 3m) New Construction Section
673	44.440	44.460	0.020	TCS-7	4 - Lane Divided Highway with Breast wall on one side (One side Filling <3m) New Construction
674	44.460	45.360	0.900	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
675	45.360	45.420	0.060	TCS-8	4 - Lane Divided Highway with Breast wall on one side (One side Cutting <3m) New Construction Section
676	45.420	45.645	0.225	TCS-10	4 - Lane Divided Highway (Both sides Breast wall) New Construction
			45.645	KM	

6.4.1 Lane Width

The width of a basic traffic lane is 3.5 m.

6.4.2 Shoulders

The shoulder width as per meeting held in RO Shillong in presence of all level field authorities on dtd. 18.07.2025. Latest available MoRT&H circulars were also apprised during the meeting for adoption of Shoulder and Median width. Cost and safety issues were thoroughly discussed with respect to shoulder and median.

The width adopted is presented in table below with relevant reference:

Table 6.6: Width of shoulders

Sr. No.	Width of shoulder (m)		
	Paved Shoulder	Earthen Shoulder	Median Width including Shyness (m)
1.	1.50 m	2.00 m	5.0 m

Note: Shoulder width finalized as per discussion and directives from the authority.

6.4.2.1 Side Slopes

The side slopes shall not be steeper than 2H:1V. In case, there is a ROW constraint than, suitable soil retaining structures shall be provided. For stability of slope upto 3 metre height, turfing can be adapted. For the slope from 3-6 metre, suitable geocell, geo-grid, geo-green etc. can be provided with suitable drainage chutes and suitable energy dissipaters as per IRC 56. For the slope more than 6 metre height, a complete slope stability analysis as per IRC:75 shall be done, and the slopes shall be compulsorily protected as per IRC codal provisions and suitable drains/chutes and energy dissipaters etc. shall be provided for effective drainage of the water. In case of cut section, hydro seeding & mulching shall be adapted. Wherever, the channel kerbs are placed for directing water in chute drains, it is to be ensured that they are flushed with the face of crash barrier. Further, the width of earthen shoulder between kerb channel and edge of paved shoulder, the same may be paved with PCC to stop erosion of earthen shoulder. Where pond ash is used for embankment construction, the embankment shall be designed and constructed in accordance with IRC: SP: 58 (Clause No. 4.2.4 & 4.4.4.i (d) IRC: SP: 84). The Concessionaire shall deploy grading, paving and compaction equipment fitted with Machine Guidance & Control System (MGCS) for finishing of all grades including Embankment, and Subgrade. 3D Machine Guidance and Control Systems for Motor Graders / Paver and 3D Machine Guidance System in Compactors and Dozers shall be done with help of 3D Digital model

generated from Design to ensure quality standards as per IRC specifications and productivity improvement. Further, Concessionaire shall ensure the generation of measurable digital records that can be shared on a digital drive or can viewed in real time. The hardware and software used by the Concessionaire shall have features and specifications mentioned at Schedule D.

6.4.3 Camber/Cross-fall

Each carriageway will have unidirectional cross-fall. The cross-fall for the flexible pavement/paved shoulder is 2.5% and for earthen shoulders the cross-fall is 3.0 %.

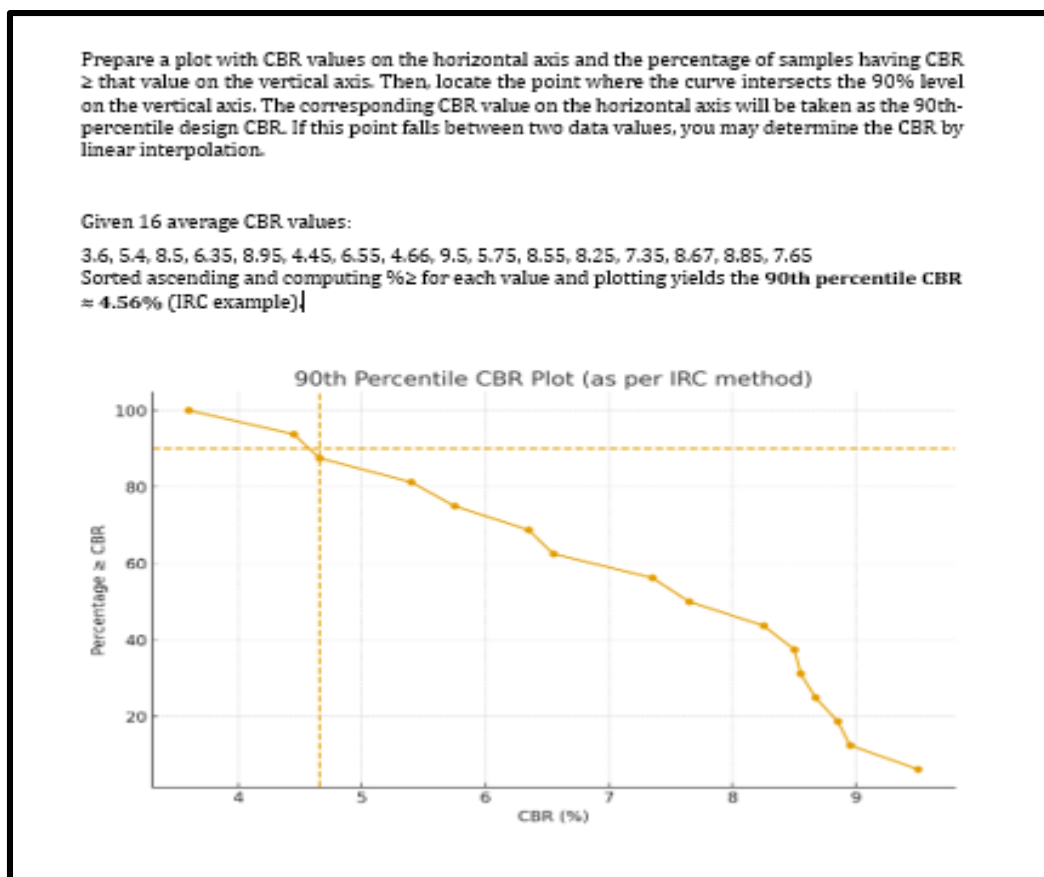
6.5 Pavement Design

Refer traffic report for details. Recommended thickness of Flexible pavement is summarized in table below: -

Table 6.7: Summary of Pavement Design

Section	Design Period (Years)	MSA	CBR (%)	Flexible Pavement Crust Composition				
				BC (mm)	DBM (mm)	WMM (mm)	CTSB (mm)	Total (mm)
Main C/w (HSC)	20	110	Minimum sub grade CBR of 8% and maximum subgrade CBR of 10%.	As per Technical Schedules				
Ramps/ Approach Roads	20	50	Minimum sub grade CBR of 8% and maximum subgrade CBR of 10%.	As per Technical Schedules				

Calculation of the 90th percentile CBR values for Subgrade:



Calculation of Elastic modulus for various layers have been presented below –

Table 6.8: Details of Pavement Design Layers

S. No.	Layer	Modulus	Reference
1.	BC with Modified Bitumen	1600	Table 9.1 of IRC 37-2018
2.	DBM	3000	Table 11.1 of IRC 37-2018
3.	WMM	350	Table 11.1 of IRC 37-2018
4.	CTSB	600	Table 11.1 of IRC 37-2018
5.	Subgrade	71.82	Subgrade-derived as per IRC 37-2018

6.5.1 Design CBR Value

Effective CBR value minimum sub grade CBR of 8% and maximum subgrade CBR of 10%.

6.5.6 Interchanges/Access Provisions

Typical Interchanges access provision's locations for PKG-01 are as follows: -

Table 6.9(a): List of Access Points

Sr. No.	Design Chainage (km)	Name of Structure	Span Arrangement (m)	Total Width (m)	Typical Cross Section	Remarks
1	0+000	VUP cum Viaduct	As Per GAD			Interchange-01
2	12+700	VUP with Ramp	As Per GAD			Interchange-02
3	27+170	Elongated Elevated Rotary	As Per GAD			Interchange-03
4	44+935	Elongated Elevated Rotary	As Per GAD			Interchange-04

Table 6.9(b): Details of Ramps, Crossroads and Connecting Roads at Interchanges (IC)

Sr. No.	Carriageway Widths including Kerb Shyness (m)	Length (m)	Description of Ramps, Crossroads and Connecting Roads	Remarks
1	9.5	1541	Ramp-01	Interchange-01 At Km 0+000
2	9.5	1630	Ramp-02	
3	9.5	364	Ramp-03	
4	9.5	444	Loop	
5	2X8.5	1211	Existing Road NH-06	
6	9.5	658	Ramp-01	Interchange-02 At Km 12+700
7	9.5	665	Ramp-02	
8	2X8.5	339	Along Existing Road NH-06	
9	12	547	Rotary	Interchange-03 At Km 27+170
10	9.5	2098	Ramp-01	
11	9.5	2151	Ramp-02	
12	9.5	582	Ramp-03	
13	9.5	590	Ramp-04	
14	10	1081	Existing Road NH-06	
15	12	547	Rotary	Interchange-04 At Km 44+935
16	9.5	1700	Ramp-01	
17	9.5	1627	Ramp-02	
18	9.5	590	Ramp-03	
19	9.5	567	Ramp-04	
20	2X8.5	905	Existing Road	
Total		19837		

6.6 Preconstruction Activities (Land Acquisition, Tree Felling & Utility Shifting)

Assessment of quantum of land that has to be acquired for development of PKG-01 is presented ahead in this article. Cost of land acquisition has been calculated as per circle rates available by now from various districts by adopting a multiplication factor of 2. However, the cost of structures/buildings, utilities, tree felling etc. has been adopted as per experience.

Note- The Land Circle rates of the villages were obtained from the DC's office, Revenue Division. The basic calculation was performed by multiplying the land area to be acquired by the Land Circle rate of the respective village. The multiplication factor was adopted from the notification issued by the Government of Meghalaya, Revenue and Disaster Management Department, dated 10th September 2014 (Letter No. RDA.27/2014/5). Further details are provided in Main Report of the DPR. (Actual compensatory amount is under preparation by state administration).

Land Acquisition, Tree Felling & Utility Shifting summary is tabulated below:

Table 6.10: Cost Abstract of Preconstruction Activities

S. No.	ITEM	Unit	Quantity
1	Land Acquisition (Realignment/Geometric improvement/Widening)	Hect.	452.24
2	Utility Shifting	LS	

Note: Actual amount for LA etc. and Utility Shifting is in process and will be presented by respective stakeholders.

Table 6.12(B): Cost Abstract of Land Acquisition
Actual amount for LA etc. is in process and will be presented by respective stakeholders.

6.7 Proposal for structures

The detail of proposal of structures is provided in the table below:

Table-6.11: Summary of CD Structure on the proposed alignment

For Main Carriageway

S. No.	Type of Structure	New Proposed
1	Major Bridge/ Major Bridge Cum Viaduct	4
2	Minor Bridge	12
3	Viaduct	27
4	Box Culvert	111 (109 New Proposed, 2 Reconstruction)
5	VOP	13
6	VUP	5
7	VUP cum Viaduct	1
8	LVUP	2
9	SVUP	11
10	Utility underpass	5

S.	Type of Structure	New
11	Overpass	4
12	Underpass	0
Total		195

For Interchanges/Existing Cross Roads

S. No.	Type of Structure	New Proposed
1	Major Bridge	0
2	Minor Bridge	2
3	Viaduct	15
4	Box Culvert	42
5	VOP	4
6	VUP	0
7	LVUP	0
8	SVUP	0
9	Utility underpass	0
10	Overpass	0
11	Underpass	0
Total		63

HPC - Hume Pipe Culvert

BC - Box Culvert

SC - Slab Culvert

MNB - Minor Bridge

MJB-Major Bridge

FOB – Foot Over Bridge

VUP- Vehicular Underpass

VOP – Vehicular Overpass

Table 6.12: Proposal of Structures

Refer Technical Schedules

6.8 Road Furniture and other Wayside Amenities

The road furniture's, traffic safety features and other facilities included in the design are:

- Road Markings
- Kilometer stones & hectometer stones
- Road signs (Cautionary, Mandatory and Informatory Signs)
- Crash Barrier

6.9 Road Markings

Road markings perform the important function of guiding and controlling traffic on a highway. The markings serve as psychological barriers and signify the delineation of traffic paths and their lateral clearance from traffic hazards for safe movement of traffic. Road markings are therefore essential to ensure smooth and orderly flow of traffic and to promote road safety. The Code of Practice for Road Markings, IRC: 35-2015 has been used in the study as the design basis. The location and type of marking lines, material and colour is followed using IRC: 35-2015 – “Code of Practice for Road Markings”.

Edge Marking: Continuous 0.15m wide white strip both side at road edge throughout the length.

6.9.1 Road Signs (Cautionary, Mandatory and Informatory Signs)

Cautionary, mandatory, and informatorily signs have been provided depending on the situation and function they perform in accordance with the IRC: 67 guidelines for Road Signs and MoRT&H circular No. 602.58 File No. RT-25035/07/2023-RS (Part) (221534) dtd. 24.12.2024 - Guidelines for Provision of Signage's on Expressways and National Highways.

Table 1: Size and Dimension of Mandatory Sign

Design Speed	Diameter (mm)	Border (mm)	Oblique Bar (mm)
81-120 kmph	1200	100	100
121-150 kmph	1500	125	125

*Oblique Bar will come to indicate in prohibition

6.9.2 Kilometer Stone Details

The details of kilo-meter stones are in accordance with IRC:8-1980 guidelines. Kilo-meter stones are located on the left-hand side of the road as one proceeds from the station from which the Kilo-meter count starts. Kilo-meter stones shall be fixed at right angles to the Centre line of the carriageway.

6.9.3 Proposed Slip/Service Road Section

Proposed Service Road Section have been proposed at access locations in form of ramps/loops. Details of Interchanges Section can be referred above **Table-6.9**

6.9.4 Metal Beam Crash Barriers

The safety measures shall be provided at all hazardous/sinking/land slide locations. The safety barriers (Thrie-beam Crash barriers) shall also be provided at the following hazardous structure (Bridges, culverts) locations where the embankment height is greater than 3.0m. semi-rigid barriers are not provided on valley side of the road at such locations where valley is present immediately next to carriageway.

The metal beam (Thrie-beam) crash barrier shall be provided on either side of median side. The chainage-wise locations of these barriers are provided.

Table 6.14: Proposed location of Metal Beam Crash Barrier
As per Technical Schedules

6.9.5 Lined drain

Lined drain has been proposed in cut sections. Due to high design speed of the project corridor, all length of lined drain has been covered. various locations of proposed covered lined drain are given below:

Table 6.15: Proposed Locations of Lined drain
Details of RCC Drain for Main Carriageway

LEFT			RIGHT			Min bottom Width x Min Depth of Drain (m)
FROM CHAINAGE (M)	TO CHAINAGE (M)	LENGTH (M)	FROM CHAINAGE (M)	TO CHAINAGE (M)	LENGTH (M)	
0+520	1+080	560	0+600	1+040	440	1.2X1.2
1+100	1+480	380	1+220	1+300	80	1.2X1.2
1+580	1+680	100	1+320	1+460	140	1.2X1.2
1+850	3+020	1170	1+600	1+680	80	1.2X1.2
3+060	3+500	440	1+880	2+440	560	1.2X1.2
3+520	4+320	800	2+460	2+560	100	1.2X1.2
4+350	4+540	190	2+660	2+860	200	1.2X1.2
4+620	4+680	60	3+080	3+220	140	1.2X1.2
4+980	5+400	420	3+260	3+500	240	1.2X1.2
5+440	5+630	190	3+540	3+680	140	1.2X1.2
5+650	6+060	410	3+860	4+300	440	1.2X1.2
6+120	7+263	1143	4+480	4+540	60	1.2X1.2
7+277	7+520	243	4+940	5+360	420	1.2X1.2
7+580	7+696	116	5+480	5+580	100	1.2X1.2
7+704	7+800	96	5+680	5+700	20	1.2X1.2
9+100	9+205	105	5+760	5+820	60	1.2X1.2
9+250	9+400	150	6+160	7+263	1103	1.2X1.2
9+420	10+265	845	7+277	7+540	263	1.2X1.2
10+500	10+560	60	7+760	7+780	20	1.2X1.2
13+760	13+840	80	9+300	9+380	80	1.2X1.2



LEFT			RIGHT			Min bottom Width x Min Depth of Drain (m)
FROM CHAINAGE (M)	TO CHAINAGE (M)	LENGTH (M)	FROM CHAINAGE (M)	TO CHAINAGE (M)	LENGTH (M)	
13+860	14+260	400	9+440	10+265	825	1.2X1.2
17+364	17+980	616	10+520	10+540	20	1.2X1.2
18+000	18+020	20	13+720	14+280	560	1.2X1.2
18+160	18+880	720	15+880	15+940	60	1.2X1.2
19+080	19+120	40	17+400	17+840	440	1.2X1.2
19+240	19+380	140	18+180	18+880	700	1.2X1.2
19+400	19+420	20	18+920	18+940	20	1.2X1.2
19+440	19+460	20	19+000	19+460	460	1.2X1.2
19+780	19+840	60	19+500	19+540	40	1.2X1.2
19+880	19+920	40	19+640	19+660	20	1.2X1.2
20+120	20+326	206	19+680	19+740	60	1.2X1.2
20+980	21+160	180	19+760	19+960	200	1.2X1.2
21+200	21+320	120	19+980	20+040	60	1.2X1.2
21+440	21+500	60	20+080	20+326	246	1.2X1.2
21+520	21+560	40	20+960	21+320	360	1.2X1.2
21+580	21+620	40	21+440	21+500	60	1.2X1.2
21+720	21+940	220	21+520	21+660	140	1.2X1.2
22+000	22+740	740	21+740	21+940	200	1.2X1.2
22+860	22+920	60	21+980	22+660	680	1.2X1.2
23+100	23+180	80	22+760	22+900	140	1.2X1.2
23+540	23+780	240	23+100	23+180	80	1.2X1.2
23+920	24+220	300	23+460	23+480	20	1.2X1.2
24+500	24+700	200	23+500	23+900	400	1.2X1.2
24+720	24+740	20	23+940	24+200	260	1.2X1.2
25+100	25+140	40	24+400	24+480	80	1.2X1.2
25+563	28+140	2577	24+500	24+740	240	1.2X1.2
28+340	28+500	160	24+960	25+185	225	1.2X1.2
28+540	28+840	300	25+580	26+960	1380	1.2X1.2
28+980	29+340	360	27+000	28+140	1140	1.2X1.2
29+620	30+060	440	28+340	28+500	160	1.2X1.2
30+740	31+000	260	28+540	28+820	280	1.2X1.2
31+240	31+300	60	28+940	29+320	380	1.2X1.2
31+560	32+340	780	29+540	30+020	480	1.2X1.2
32+360	33+080	720	30+740	31+000	260	1.2X1.2
33+700	34+160	460	31+540	33+080	1540	1.2X1.2
34+200	34+600	400	33+700	34+580	880	1.2X1.2
34+840	35+006	166	34+840	34+940	100	1.2X1.2
35+480	35+700	220	35+480	35+700	220	1.2X1.2
35+900	35+960	60	35+820	35+900	80	1.2X1.2
36+040	36+865	825	35+980	36+000	20	1.2X1.2
36+920	37+080	160	36+020	36+865	845	1.2X1.2
37+200	37+680	480	36+920	37+100	180	1.2X1.2
38+060	38+080	20	37+200	37+600	400	1.2X1.2
38+100	38+300	200	38+060	38+080	20	1.2X1.2
38+320	38+360	40	38+220	38+240	20	1.2X1.2
38+640	39+000	360	38+640	38+960	320	1.2X1.2
39+340	39+600	260	39+360	39+380	20	1.2X1.2
39+740	40+020	280	39+420	39+580	160	1.2X1.2
40+180	40+240	60	39+740	40+080	340	1.2X1.2
40+520	40+640	120	40+180	40+260	80	1.2X1.2
40+780	40+840	60	40+540	40+650	110	1.2X1.2
41+100	41+240	140	40+720	40+740	20	1.2X1.2
41+420	41+640	220	40+780	40+865	85	1.2X1.2
41+660	41+980	320	40+875	41+240	365	1.2X1.2
42+020	42+040	20	41+420	41+620	200	1.2X1.2
42+060	42+620	560	41+640	41+980	340	1.2X1.2

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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LEFT			RIGHT			Min bottom Width x Min Depth of Drain (m)
FROM CHAINAGE (M)	TO CHAINAGE (M)	LENGTH (M)	FROM CHAINAGE (M)	TO CHAINAGE (M)	LENGTH (M)	
42+720	42+743	23	42+020	42+645	625	1.2X1.2
43+140	43+380	240	43+140	43+400	260	1.2X1.2
43+420	43+540	120	43+420	43+540	120	1.2X1.2
43+880	44+020	140	43+880	44+040	160	1.2X1.2
44+060	44+380	320	44+060	44+440	380	1.2X1.2
44+420	45+645	1225	44+460	45+645	1185	1.2X1.2
		25336	Total		24437	

Details of RCC Drain for Interchanges

Left Side			Right Side		
Ch. From	Ch. To	Length (m)	Ch. From	Ch. To	Length (m)
Interchange at km 0+000 including Approach/connecting roads		3811	Interchange at km 0+000 including Approach/connecting roads		3811
Interchange at km 12+700 including Approach/connecting roads		339	Interchange at km 12+700 including Approach/connecting roads		339
Interchange at km 27+170 including Approach/connecting roads		5182	Interchange at km 27+170 including Approach/connecting roads		5182
Interchange at km 44+935 including Approach/connecting roads		4405	Interchange at km 44+935 including Approach/connecting roads		4405
Total		13737	Total		13737

Additionally, chute drains are proposed on both sides along the entire length where the embankment height exceeds 3.0 m.

6.9.5.1 Turfing

Provision for Turfing as part of the slope protection/erosion control measures has been made for the exposed face of the cut in the entire project stretch. Additionally, Full-face shotcrete, welded mesh, weep holes, and full drainage provisions (As per Cross section attached as Annexure-II of Schedule B) shall be provided for rockfall measures in a length of 2160m (For Main Carriageway) and 4580m (For Interchanges). The turfing shall be installed in accordance with the approved drawings, manufacturer's recommendations, and relevant specifications to ensure effective erosion control and stabilization of the slope surface. Necessary turfing, seeding & mulching, or plantation works, wherever required, shall be carried out immediately after laying the Turfing/seeding Mulching to achieve vegetation growth and long-term stability. Moreover, slope management with drainage maintenance would be essential part of the maintenance period of concessionaire. The Concessionaire shall obtain approval / No Objection Certificate from the Independent Engineer and the Authority prior to implementation of Slope Protection/Erosion control measures and maintain records of source, quality, and installation for verification.

Table 6.16: Proposed Turfing locations

Length (m)	Side	Avg. Height(m)
As Above		

6.9.5.2 Special Requirements

The project road traverses hilly and mountainous terrain involving substantial hill cutting, making slope stability vital for environmental preservation, sustainability, and safety. Detailed investigations of all cut and fill slopes beyond 3 m depth/height shall be carried out, covering soil and rock strata, geological conditions, faults, and fractures. Stabilization measures shall follow IRC: SP 48:1998, IRC: 56-2011, and IRC: SP-106-2015, including top-down excavation, benches, drainage arrangements, and erosion control. Hill cutting shall generally be executed at 1H:1V slope with 2 m benches and Catch Water Drains at 6–7 m intervals, with steeper slopes permitted only after soil investigations and suitable stabilization at the contractor's cost. Provision for Turfing as part of the slope protection/erosion control measures has been made for the exposed face of the cut in the entire project stretch. Additionally, Full-face shotcrete, welded mesh, weep holes, and full drainage provisions (As per Cross section attached as Annexure-II of Schedule B) shall be provided for rockfall measures in a length of 2160m (For Main Carriageway) and 4580m (For Interchanges). Adequate surface and sub-surface drainage, including kerbs, CC channels, chutes, culverts, perforated pipes, gravel filters, and weep holes, shall be provided to ensure safe water disposal. Turfing, seeding, and plantation works shall be undertaken immediately after installation to achieve vegetation growth and long-term stability. Approvals from the Independent Engineer and Authority are mandatory prior to construction, and records of turfing source, quality, and installation shall be maintained. Any increase in length will not be considered a change of scope, and slope management with drainage maintenance shall remain an essential responsibility during the maintenance period.

RCC Crash Barrier with Friction Slab

As per Technical Schedules

6.9.10 Retaining Wall

Retaining walls are provided throughout the fill sections. The adopted retaining wall heights range from 1.5 m to 10 m, with an average height of 6 m. A fill slope of 1H:2V has been adopted. The locations of retaining wall are given below:

Table 6.17: Proposed Retaining Wall

RCC Retaining Wall- (For Main Carriageway)

<u>Left Side</u>			<u>Right Side</u>		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
8+800	8+820	20	1+040	1+220	180
10+640	10+840	200	2+440	2+460	20
11+260	11+300	40	2+560	2+640	80
12+400	12+480	80	2+860	2+960	100
12+500	12+683	183	2+980	3+020	40
12+717	12+880	163	3+030	3+080	50
13+120	13+160	40	3+220	3+240	20
16+000	16+020	20	3+500	3+540	40
16+880	16+900	20	3+680	3+800	120
18+980	19+080	100	3+820	3+860	40
19+140	19+240	100	4+350	4+480	130
19+380	19+400	20	4+620	4+680	60
19+420	19+440	20	5+440	5+480	40
19+460	19+500	40	5+580	5+630	50
19+540	19+640	100	5+650	5+680	30
19+660	19+680	20	5+700	5+760	60
19+700	19+720	20	5+840	6+060	220
19+840	19+860	20	6+100	6+160	60
19+960	19+980	20	7+560	7+580	20
20+040	20+080	40	7+600	7+640	40
20+334	20+536	202	7+704	7+760	56
20+560	20+640	80	8+800	8+820	20
21+160	21+180	20	9+100	9+205	105
23+220	23+380	160	9+250	9+300	50
24+260	24+310	50	9+380	9+420	40
24+330	24+360	30	10+640	10+840	200
24+420	24+440	20	11+260	11+300	40
24+740	24+775	35	12+400	12+480	80
24+785	24+810	25	12+500	12+683	183
24+820	24+880	60	12+717	12+880	163
24+880	24+960	80	13+120	13+160	40
24+980	25+040	60	16+760	16+780	20
25+060	25+100	40	20+334	20+536	202

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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<u>Left Side</u>			<u>Right Side</u>		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
25+140	25+185	45	20+560	20+640	80
28+900	28+940	40	20+640	20+920	280
29+420	29+480	60	24+260	24+310	50
29+500	29+520	20	24+330	24+360	30
29+540	29+560	20	24+740	24+775	35
29+580	29+600	20	24+785	24+810	25
31+040	31+200	160	24+820	24+880	60
31+460	31+496	36	28+200	28+280	80
31+504	31+540	25	28+820	28+840	20
31+540	31+560	20	31+020	31+240	220
33+640	33+700	60	31+460	31+496	36
35+820	35+840	20	31+504	31+540	25
35+960	36+000	40	34+580	34+600	20
37+680	37+705	25	34+960	35+006	46
38+026	30+060	34	35+920	35+960	40
39+620	39+635	15	37+680	37+705	25
39+645	39+700	55	38+026	30+060	34
40+040	40+060	20	38+340	38+360	20
40+080	40+105	25	38+960	39+000	40
40+150	40+180	30	39+340	39+360	20
40+280	40+335	55	39+620	39+635	15
40+345	40+435	90	39+645	39+700	55
40+445	40+480	35	40+445	40+520	75
40+445	40+480	35	41+240	41+273	33
40+720	40+780	60	41+288	41+340	52
40+840	40+865	25	42+763	42+780	17
40+875	41+020	145	42+920	42+980	60
41+240	41+273	33	43+100	43+140	40
41+288	41+340	52	43+740	43+780	40
42+820	42+920	100	43+820	43+860	40
42+920	42+980	60			
43+100	43+140	40			
43+680	43+700	20			
43+740	43+780	40			
43+820	43+860	40			
Total (m)		3728	Total (m)		4212

RCC Retaining Wall- (For Interchanges)

<u>Left Side</u>			<u>Right Side</u>		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)

Left Side			Right Side		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
Interchange at km 0+000		100	Interchange at km 0+000		100
Interchange at km 12+325		Nil	Interchange at km 12+325		Nil
Interchange at km 27+000		Nil	Interchange at km 27+000		Nil
Interchange at km 45+000		Nil	Interchange at km 45+000		Nil
Total (m)		100	Total (m)		100

6.9.11 RCC Toe Wall

A RCC toe wall has been proposed along the toe line of the embankment to maintain the right-of-way limits. Toe walls are provided to stabilize embankment slopes and to control erosion in fill sections or in locations vulnerable to scouring. A toe wall height of 1.3 m has been adopted. Locations of toe wall is given below:

Table 6.18: Proposed Toe Wall

Left Side			Right Side		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
0+460	0+500	40	0+460	0+580	120
1+080	1+100	20	1+480	1+505	25
1+515	1+540	25	1+515	1+580	65
3+030	3+060	30	1+680	1+690	10
3+500	3+520	20	1+850	1+880	30
6+100	6+120	20	2+960	2+980	20
7+540	7+580	40	3+800	3+820	20
9+400	9+420	20	4+300	4+320	20
10+840	11+140	300	4+680	4+720	40
11+300	11+760	460	5+380	5+400	20
11+940	12+220	280	5+820	5+840	20
13+440	13+540	100	7+540	7+560	20
14+400	14+420	20	7+680	7+696	16
14+440	14+540	100	9+420	9+440	20
14+860	15+540	680	10+840	11+140	300
15+800	15+860	60	11+300	11+320	20
16+020	16+220	200	11+400	11+760	360
16+340	16+620	280	11+940	12+100	160
16+760	16+880	120	12+160	12+220	60
16+900	17+060	160	13+440	13+520	80
17+140	17+180	40	14+860	15+220	360
18+060	18+080	20	15+240	15+540	300
18+100	18+140	40	15+800	15+840	40
18+900	18+920	20	16+000	16+220	220
18+940	18+980	40	16+380	16+460	80



<u>Left Side</u>			<u>Right Side</u>		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
19+500	19+540	40	16+520	16+540	20
19+640	19+660	20	16+780	17+180	400
19+680	19+700	20	17+880	17+900	20
19+720	19+780	60	17+920	17+980	60
19+860	19+880	20	18+000	18+180	180
19+920	19+960	40	18+980	19+000	20
19+980	20+040	60	19+460	19+500	40
20+640	20+960	320	19+540	19+640	100
21+500	21+520	20	19+660	19+680	20
21+640	21+680	40	19+960	19+980	20
21+980	22+000	20	20+040	20+080	40
22+740	22+840	100	20+920	20+960	40
23+060	23+100	40	22+700	22+740	40
23+200	23+220	20	23+200	23+380	180
23+480	23+500	20	24+220	24+240	20
23+820	23+900	80	24+880	24+960	80
24+240	24+260	20	25+300	25+528	228
24+360	24+420	60	25+563	25+580	17
24+440	24+500	60	28+180	28+200	20
25+300	25+528	228	28+280	28+320	40
28+140	28+280	140	28+840	28+940	100
28+860	28+900	40	29+400	29+520	120
28+940	28+960	20	30+040	30+060	20
29+380	29+420	40	31+240	31+300	60
29+480	29+500	20	33+105	33+160	55
29+520	29+540	20	33+225	33+250	25
29+560	29+580	20	33+570	33+700	130
29+600	29+620	20	35+454	35+480	26
31+020	31+040	20	35+960	35+980	20
31+200	31+240	40	37+640	37+680	40
33+080	33+095	15	38+080	38+220	140
33+225	33+250	25	38+240	38+340	100
33+570	33+600	30	39+320	39+340	20
33+620	33+640	20	39+380	39+400	20
34+160	34+180	20	39+700	39+720	20
35+454	35+480	26	40+080	40+105	25
35+840	35+900	60	40+150	40+180	30
38+300	38+320	20	40+280	40+335	55
39+700	39+720	20	40+345	40+435	90
40+020	40+040	20	40+520	40+540	20
40+260	40+280	20	40+700	40+720	20
40+480	40+520	40	40+740	40+780	40

Left Side			Right Side		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
40+700	40+720	20	41+340	41+400	60
41+020	41+100	80	42+675	42+720	45
41+340	41+420	80	42+780	42+920	140
42+675	42+700	25	43+600	43+700	100
42+763	42+820	57			
43+580	43+680	100			
43+700	43+740	40			
Total (m)		5521	Total (m)		5532

6.9.12 Stone Pitching

Stone Pitching has been proposed for side slope protection along the embankment at appropriate locations. Details of Stone pitching proposed are given in the table below:

Table 6.19: Proposed Locations of Stone Pitching

Left Side			Right Side		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
0+460	0+500	40	0+460	0+580	120
1+080	1+100	20	1+040	1+080	40
1+515	1+540	25	1+120	1+220	100
3+030	3+060	30	1+480	1+505	25
3+500	3+520	20	1+515	1+580	65
6+100	6+120	20	1+680	1+690	10
7+540	7+580	40	1+850	1+880	30
9+400	9+420	20	2+440	2+460	20
10+640	11+140	500	2+560	2+640	80
11+260	11+760	500	2+860	3+020	160
11+940	12+220	280	3+060	3+080	20
13+120	13+160	40	3+220	3+240	20
13+440	13+540	100	3+520	3+540	20
14+400	14+420	20	3+680	3+860	180
14+440	14+540	100	4+300	4+320	20
14+860	15+540	680	4+350	4+480	130
15+800	15+860	60	4+620	4+720	100
16+020	16+220	200	5+380	5+400	20
16+340	16+620	280	5+440	5+480	40
16+760	16+880	120	5+580	5+630	50
16+900	17+060	160	5+650	5+680	30
17+140	17+180	40	5+700	5+760	60
18+060	18+080	20	5+820	6+060	240
18+100	18+140	40	6+140	6+160	20
18+900	18+920	20	7+540	7+560	20



Left Side			Right Side		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
18+940	18+980	40	7+600	7+640	40
19+000	19+080	80	7+680	7+696	16
19+140	19+240	100	7+704	7+760	56
19+380	19+400	20	9+100	9+205	105
19+420	19+440	20	9+250	9+300	50
19+500	19+540	40	9+380	9+400	20
19+640	19+660	20	9+420	9+440	20
19+680	19+780	100	10+640	11+140	500
19+840	19+880	40	11+260	11+320	60
19+920	19+960	40	11+400	11+760	360
19+980	20+040	60	11+940	12+100	160
20+640	20+960	320	12+160	12+220	60
21+160	21+180	20	13+120	13+160	40
21+500	21+520	20	13+440	13+520	80
21+640	21+680	40	14+860	15+220	360
21+980	22+000	20	15+240	15+540	300
22+740	22+840	100	15+800	15+840	40
23+060	23+100	40	16+000	16+220	220
23+200	23+220	20	16+380	16+460	80
23+480	23+500	20	16+520	16+540	20
23+820	23+900	80	16+780	17+180	400
24+240	24+260	20	17+880	17+900	20
24+360	24+500	140	17+920	17+980	60
24+980	25+040	60	18+000	18+180	180
25+060	25+100	40	18+980	19+000	20
25+140	25+185	45	19+460	19+500	40
25+300	25+528	228	19+540	19+640	100
28+140	28+280	140	19+660	19+680	20
28+860	28+900	40	19+960	19+980	20
28+940	28+960	20	20+040	20+080	40
29+380	29+420	40	20+920	20+960	40
29+480	29+500	20	22+700	22+740	40
29+520	29+620	100	23+200	23+380	180
31+020	31+240	220	24+220	24+240	20
31+540	31+560	20	24+880	24+960	80
33+080	33+095	15	25+300	25+528	228
33+225	33+250	25	25+563	25+580	17
33+570	33+600	30	28+180	28+200	20
33+620	33+640	20	28+280	28+320	40
34+160	34+180	20	28+820	28+940	120
35+454	35+480	26	29+400	29+520	120
35+820	35+900	80	30+040	30+060	20
35+980	36+000	20	31+040	31+200	160

Left Side			Right Side		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
38+300	38+320	20	31+240	31+300	60
39+700	39+720	20	33+105	33+160	55
40+020	40+060	40	33+225	33+250	25
40+260	40+280	20	33+570	33+700	130
40+445	40+520	75	34+580	34+600	20
40+700	40+740	40	34+960	35+006	46
40+840	40+865	25	35+454	35+480	26
40+875	41+100	225	35+920	35+980	60
41+340	41+420	80	37+640	37+680	40
42+675	42+700	25	38+080	38+220	140
42+763	42+820	57	38+240	38+360	120
43+580	43+680	100	38+960	39+000	40
43+700	43+740	40	39+320	39+360	40
			39+380	39+400	20
			39+700	39+720	20
			40+080	40+105	25
			40+150	40+180	30
			40+280	40+335	55
			40+345	40+435	90
			40+445	40+480	35
			40+520	40+540	20
			40+700	40+720	20
			40+740	40+780	40
			41+340	41+400	60
			42+675	42+720	45
			42+800	42+920	120
			43+600	43+700	100
Total (m)		6751	Total (m)		7674

6.9.13 Composite Breast Wall

A composite breast wall with an average height of 4.0 m has been proposed. Breast walls are provided throughout the cut sections where the cutting depth is 2 m or more, with an adopted average height of 4.0 m. A cut slope of 1H:1V has been adopted. The locations of breast wall are given below:

Table 6.20: Proposed Composite Breast Wall (of appropriate type)
For Main Carriageway

Left Side			Right Side		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)



<u>Left Side</u>			<u>Right Side</u>		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
0+540	1+080	540	0+600	1+020	420
1+120	1+480	360	1+240	1+260	20
1+580	1+680	100	1+320	1+440	120
1+850	2+640	790	1+600	1+660	60
2+660	2+960	300	1+900	2+260	360
2+980	3+020	40	2+280	2+420	140
3+060	3+500	440	2+700	2+840	140
3+520	3+800	280	3+140	3+180	40
3+820	4+320	500	3+280	3+480	200
4+350	4+540	190	3+900	4+300	400
4+620	4+680	60	4+940	5+360	420
5+020	5+400	380	5+540	5+560	20
5+440	5+630	190	5+760	5+800	40
5+650	6+060	410	6+200	6+360	160
6+120	7+263	1143	6+440	7+220	780
7+300	7+500	200	7+277	7+420	143
7+600	7+696	96	7+480	7+520	40
7+704	7+800	96	9+340	9+360	20
9+100	9+205	105	9+440	9+820	380
9+250	9+400	150	9+860	10+220	360
9+420	10+265	845	13+740	13+840	100
10+520	10+560	40	13+880	14+260	380
13+880	14+160	280	17+420	17+760	340
14+180	14+240	60	18+220	18+860	640
17+400	17+920	520	19+000	19+460	460
17+940	17+960	20	19+500	19+520	20
18+160	18+860	700	19+700	19+740	40
19+260	19+380	120	19+780	19+860	80
19+820	19+840	20	19+880	19+940	60
20+140	20+300	160	20+080	20+326	246
20+980	21+140	160	20+980	21+320	340
21+200	21+300	100	21+440	21+500	60
21+440	21+500	60	21+520	21+560	40
21+520	21+560	40	21+580	21+660	80
21+780	21+820	40	21+760	21+920	160
22+020	22+100	80	22+000	22+640	640
22+120	22+740	620	22+780	22+900	120
23+560	23+760	200	23+100	23+160	60
23+940	24+060	120	23+520	23+900	380
24+120	24+200	80	23+940	24+200	260
24+540	24+680	140	24+400	24+480	80
25+580	28+040	2460	24+500	24+740	240



<u>Left Side</u>			<u>Right Side</u>		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
28+340	28+500	160	24+980	25+040	60
28+560	28+840	280	25+060	25+185	125
28+980	29+100	120	25+580	26+940	1360
29+160	29+340	180	27+020	27+940	920
29+640	29+900	260	28+060	28+100	40
29+940	30+060	120	28+360	28+480	120
30+760	30+980	220	28+560	28+820	260
31+580	32+340	760	28+940	29+320	380
32+360	33+060	700	29+540	29+880	340
33+700	34+140	440	29+940	30+020	80
34+260	34+600	340	30+760	30+960	200
34+860	35+006	146	31+540	33+080	1540
35+500	35+700	200	33+700	34+140	440
35+900	35+960	60	34+180	34+460	280
36+040	36+865	825	34+500	34+540	40
36+920	37+080	160	34+840	34+940	100
37+200	37+680	480	35+500	35+700	200
38+060	38+080	20	35+820	35+880	60
38+100	38+240	140	35+980	36+000	20
38+260	38+280	20	36+040	36+820	780
38+320	38+360	40	36+840	36+865	25
38+640	39+000	360	36+940	37+100	160
39+340	39+600	260	37+240	37+320	80
39+740	40+000	260	37+360	37+400	40
40+200	40+240	40	37+420	37+540	120
40+540	40+560	20	37+560	37+600	40
40+620	40+640	20	38+220	38+240	20
40+800	40+820	20	38+660	38+960	300
41+120	41+240	120	39+420	39+580	160
41+440	41+640	200	39+740	40+060	320
41+660	41+980	320	40+220	40+260	40
42+080	42+620	540	40+540	40+640	100
43+160	43+380	220	40+720	40+740	20
43+420	43+520	100	40+780	40+865	85
43+880	44+020	140	40+875	41+240	365
44+080	44+380	300	41+420	41+620	200
44+440	45+645	1205	41+660	41+980	320
			42+020	42+040	20
			42+060	42+620	560
			43+140	43+400	260
			43+420	43+520	100
			43+900	44+020	120

<u>Left Side</u>			<u>Right Side</u>		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
			44+100	44+400	300
			44+460	45+360	900
			45+420	45+645	225
Total (m)		23031	Total (m)		21314

For Interchanges

<u>Left Side</u>			<u>Right Side</u>		
Design Chainage (From)	Design Chainage (To)	Length (m)	Design Chainage (From)	Design Chainage (To)	Length (m)
Interchange at km 0+000		2600	Interchange at km 0+000		2600
Interchange at km 12+325		Nil	Interchange at km 12+325		Nil
Interchange at km 27+000		4100	Interchange at km 27+000		4100
Interchange at km 45+000		3500	Interchange at km 45+000		3500
Total (m)		10200	Total (m)		10200

6.9.14 Provision of muck disposal

As per clause “13.13” of section 13 (Special Requirement for Hill Road) of IRC: SP-84 specified in Schedule-D.

Approximate quantity of **22822255** cum of muck/debris is anticipated to be generated from roadway cutting and excavation works. The Concessionaire/Contractor shall identify suitable muck disposal locations in consultation with the local village authorities, District Administration and Forest Department, as applicable.

All statutory approvals, permissions, and No-Objection Certificates (NOCs) required for muck disposal shall be obtained by the Concessionaire/Contractor at his own cost, in addition to the clearances stipulated under Schedule-E of the Contract.

No muck disposal shall be permitted within Reserved Forest areas. Disposal of approximately **22822255** cum of muck/debris shall be carried out only at designated approved locations by providing suitable retaining structures of adequate height and properly design for stability, complete in all respects, as per MoRTH Specifications and directions of the Engineer, including all leads, lifts, labour, materials, equipment, and incidentals.

Sr. No.	Muck Disposal Location (Chainage in m.)	Length (m)	Width(m)	Height (m)	Capacity/Volume (cum)
Nil					

Note- Muck disposal location selected adjacent to grow at intermittent and appropriate location for filling/dumping the muck. Environmental impact assessment report will be submitted separately.

6.9.15 Proposed Toll Plaza

Tolling system shall be provided in entire length of the project and the same is integrated with the adjoining packages. The toll plazas shall be provided as per NHAI circular No.17.5.82 dated 24/05/2021. Minimum Lane requirement in the opening year are as follows.

Toll locations have been provisioned at all access locations. Each direction for entry to project corridor is provided with entry booms for necessary registering travel start point of vehicles. Each direction for exit from project corridor is provisioned with toll booths.

Toll plaza shall be provided at the following locations:

Table 6.21: Proposed Toll Plaza/Toll Booth locations

S. No.	Existing Chainage (km)	Design Chainage (km)	Direction	Minimum number of Toll Lanes		Remarks
				Entry	Exit	
1	-	0+900	Ramp-01– Shillong to Silchar	3		Interchange-01 At Km 0+000
2	-	0+600	Ramp-02- Silchar to Shillong		3	
3	-	0+300	Loop- Silchar to Shillong		3	
4	-	0+100	Ramp-03- Silchar to Shillong	3		
5	-	0+260	Ramp-01– Shillong to Silchar		2	Interchange-02 At Km 12+700
6	-	0+320	Ramp-02- Silchar to Shillong	2		
7	-	0+460	Ramp-01– Shillong to Silchar	2		
8	-	0+475	Ramp-02- Silchar to Shillong		2	
9	-	0+275	Ramp-01- Silchar to Shillong	2		Interchange-03 At Km 27+170
10	-	1+890	Ramp-02– Shillong to Silchar		2	
11	-	0+260	Ramp-03– Shillong to Silchar	2		
12	-	0+310	Ramp-04- Silchar to Shillong		2	
13	-	0+340	Ramp-01- Silchar to Shillong	2		Interchange-04 At Km 44+935
14	-	1+360	Ramp-02– Shillong to Silchar		2	
15	-	0+250	Ramp-03– Shillong to Silchar	2		
16	-	0+330	Ramp-04- Silchar to Shillong		2	

Note: Plan showing the directional details at each location is provided in Plan & Profile (separately submitted). Number of toll lanes have been projected with standard capacity of 900 vehicles per hour per lane for ETC type tolling.

6.10 Advanced Traffic Management System (ATMS)

The Concessionaire is required to design, install, operate and maintain Advanced Traffic Management System (ATMS) as part of the project facilities. Advanced Traffic Management System shall be provided as per standards and specifications specified in the manual and as per NHAI circular and shall be maintained throughout the contract period. (NHAI Policy circular no.11.53/2023 dated 10.10.2023).

The ATMS components to be deployed shall inter alia include:

6.10.1 General

The ATMS Project shall broadly include the following sub-systems to be provided as per the standards & specifications mentioned in NHAI policy circular technical (NHAI Policy circular no.11.53/2023 dated 10.10.2023):

- Video Surveillance System / Traffic Monitoring Camera System (TMCS)
- Video Incident Detection and Enforcement System (VIDES)
- Vehicle Actuated Speed Display System (VASD)
- Fixed and Portable Variable Message Sign (VMS) System
- Communication Network with OFC Backbone
- Emergency Roadside Telephone System (ECB)
- Emergency Call Box*
- Mobile Radio Communication System*
- ATMS Command & Control Center with ATMS Software.
- Power Supply for Field Equipment as well as for ATMS Command & Control Center.

The requirements stated herein shall be construed as minimum requirement and meeting the respective requirements individually shall not relieve the Concessionaire from the responsibility. The entire system should function efficiently as an integrated solution during the entire O&M period.

6.10.2 Video Surveillance System / Traffic Monitoring Camera System (TMCS)

- The system monitors vehicular and other road related activity along the highway stretch through PTZ Camera mounted on Poles. Generally, the camera should be placed at a distance not greater than 1km so as to effectively monitor all the lanes of the entire stretch of Highway. In case certain stretches include regular curves, ramps etc. not allowing central line of sight, then additional TMCS camera shall be put to ensure effective surveillance of the entire stretch. The TMCS cameras should also be placed on the following Junctions below the Grade Separated Structure.
- The TMCS should also be provided at the following locations so as to monitor the traffic at the following locations:

Sr. No.	Equipment name	Location (Km)	LHS/RHS/BHS	Remarks
1	TMCS+RSU	0+000	Median	Pole Mounted
2	TMCS+RSU	1+000	Median	Pole Mounted
3	TMCS+RSU	2+000	Median	Pole Mounted
4	TMCS+RSU	3+000	Median	Pole Mounted
5	TMCS+RSU	4+000	Median	Pole Mounted
6	TMCS+RSU	5+000	Median	Pole Mounted
7	TMCS+RSU	6+000	Median	Pole Mounted
8	TMCS+RSU	7+000	Median	Pole Mounted
9	TMCS+RSU	8+000	Median	Pole Mounted
10	TMCS+RSU	9+000	Median	Pole Mounted

Sr. No.	Equipment name	Location (Km)	LHS/RHS/BHS	Remarks
11	TMCS+RSU	10+000	Median	Pole Mounted
12	TMCS+RSU	11+000	Median	Pole Mounted
13	TMCS+RSU	12+000	Median	Pole Mounted
14	TMCS+RSU	13+000	Median	Pole Mounted
15	TMCS+RSU	14+000	Median	Pole Mounted
16	TMCS+RSU	15+000	Median	Pole Mounted
17	TMCS+RSU	16+000	Median	Pole Mounted
18	TMCS+RSU	17+000	Median	Pole Mounted
19	TMCS+RSU	18+000	Median	Pole Mounted
20	TMCS+RSU	19+000	Median	Pole Mounted
21	TMCS+RSU	20+000	Median	Pole Mounted
22	TMCS+RSU	21+000	Median	Pole Mounted
23	TMCS+RSU	22+000	Median	Pole Mounted
24	TMCS+RSU	23+000	Median	Pole Mounted
25	TMCS+RSU	24+000	Median	Pole Mounted
26	TMCS+RSU	25+000	Median	Pole Mounted
27	TMCS+RSU	26+000	Median	Pole Mounted
28	TMCS+RSU	27+000	Median	Pole Mounted
29	TMCS+RSU	28+000	Median	Pole Mounted
30	TMCS+RSU	29+000	Median	Pole Mounted
31	TMCS+RSU	30+000	Median	Pole Mounted
32	TMCS+RSU	31+000	Median	Pole Mounted
33	TMCS+RSU	32+000	Median	Pole Mounted
34	TMCS+RSU	33+000	Median	Pole Mounted
35	TMCS+RSU	34+000	Median	Pole Mounted
36	TMCS+RSU	35+000	Median	Pole Mounted
37	TMCS+RSU	36+000	Median	Pole Mounted
38	TMCS+RSU	37+000	Median	Pole Mounted
39	TMCS+RSU	38+000	Median	Pole Mounted
40	TMCS+RSU	39+000	Median	Pole Mounted
41	TMCS+RSU	40+000	Median	Pole Mounted
42	TMCS+RSU	41+000	Median	Pole Mounted
43	TMCS+RSU	42+000	Median	Pole Mounted
44	TMCS+RSU	43+000	Median	Pole Mounted
45	TMCS+RSU	44+000	Median	Pole Mounted
46	TMCS+RSU	45+000	Median	Pole Mounted

6.10.3 Video Incident Detection and Enforcement System (VIDES)

The VIDES include Gantry Mounted ANPR Cameras, Overview Cameras and associated incident detection software system to effectively detect pre-defined actionable incidents which triggers enforcement and incident response system. The VIDES should also act as Automatic Traffic Counting and Classifying (ATCC) system. The VIDES should be provided at following locations:

S. No	Location (Km)	Remarks	Availability of Full Gantry**
1	0+000	BHS	No
2	12+700	BHS	No
3	27+140	BHS	No
4	45+490	BHS	No

** [VIDS system requires full Gantry on both LHS & RHS]

6.10.4 Vehicle Actuated Speed Display (VASD) System

The VASD system shall include gantry mounted Radar and Speed Display system for each lane to warn the road users of their speed. The system shall act as a Speed Calming Measure. VASD System should be provided at following locations along the Expressways:

S. No.	Location (Km)	Remarks	Availability of Full Gantry**
1	33+900	BHS	VASD on Butterfly type Gantry

** [VIDS system requires full Gantry on both LHS & RHS]

6.10.5 Fixed and Portable Variable Message Sign (VMS) System

The VMS shall provide road users advance information of road conditions ahead and shall be controlled from the local ATMS Control center. The VMS shall be installed at following locations:

6.10.5.1 Fixed VMS

Gantry (M Type)

S. No.	Location (Km)	Remarks	Availability of Full Gantry**
1	10+135 (Shillong-Silchar)	on VOP	No
2	10+135 (Silchar-Shillong)	on VOP	No

** [VIDS system requires full Gantry on both LHS & RHS]

Cantilever (L Type)

S. No	Location (Km)	Remarks	Availability of Gantry**
1		Nil	

** [VIDS system requires full Gantry on both LHS & RHS]

Portable VMS

The Concessionaire shall provide 02 (No.) Trolley Mounted Portable VMS.

6.10.5.2 Communication Network with OFC Backbone

The entire stretch shall be provided with a minimum of 24 Core OFC Backbone as per the standards & specifications. The short haul connections, like between field equipment to access

points, access points to OFC backbone etc., shall be done with a minimum of 12 Core cable. The OFC shall be laid strictly as per the Standards and Specification.

6.10.5.3 Emergency Roadside Telephone System (ECB)

The existing emergency call box shall be provided as per NHA Policy circular no.11.53/2023 dated 10.10.2023.

S. No.	Equipment name	Location	Side	Remark
1	ECB+RSU	2+000	BHS	To enable a caller from the highway to provide urgent messages on Accidents/incidents and road congestion for supporting the Emergency Response System. Emergency Road Side Telephone (ERT) / ECB shall be provided at every 2 km along the Project Highway. In addition to this, zones experiencing telecom blackspots along the Project Highway need be identified to be provided with ERT. On long highway stretches (> 2 Km) suffering from telecom blackspots, ERT to be located at every 2 Km on both sides of the highway stretch.
2	ECB+RSU	4+000	BHS	
3	ECB+RSU	6+000	BHS	
4	ECB+RSU	8+000	BHS	
5	ECB+RSU	10+000	BHS	
6	ECB+RSU	12+000	BHS	
7	ECB+RSU	14+000	BHS	
8	ECB+RSU	16+000	BHS	
9	ECB+RSU	18+000	BHS	
10	ECB+RSU	20+000	BHS	
11	ECB+RSU	22+000	BHS	
12	ECB+RSU	24+000	BHS	
13	ECB+RSU	26+000	BHS	
14	ECB+RSU	28+000	BHS	
15	ECB+RSU	30+000	BHS	
16	ECB+RSU	32+000	BHS	
17	ECB+RSU	34+000	BHS	
18	ECB+RSU	36+000	BHS	
19	ECB+RSU	38+000	BHS	
20	ECB+RSU	40+000	BHS	
21	ECB+RSU	42+000	BHS	
22	ECB+RSU	44+000	BHS	

6.10.6 ATMS Command and Control Center

The Concessionaire shall integrate ATMS with existing Control Centre and operate the ATMS Command and Control Center as per the Standards and Specification. The Concessionaire shall undertake any additional civil works, interior works, MEP works, for setting up the Command Center, including all additional related electrical, lighting, electrical connection, DG set, power backup, HVAC works, access control, building CCTV, PTZ cameras outside building, firefighting system, alarm, fire extinguishers, raised floor, housekeeping, building cleaning, maintenance, recurring charges including electricity bills, telephone bills, DG fuel, servicing, security.

6.10.7 Power Supply for ATMS Command & Control Center and Field Equipment

The Concessionaire shall ensure 24x7 supply for the ATMS Command and Control Centre and Field Equipment with supply power from Electricity Department as primary source supported by UPS renewable power (solar etc.) and DG Set of adequate capacity.

There shall be NO obligation of NHIDCL with regard to providing power/ electricity supply/connections for testing commission, operation & maintenance of any component of the ATMS. Further, the following points are also to be observed by the ATMS Concessionaire:

- The Concessionaire shall perform all the necessary application procedures to the Power Company required for the power to be supplied to the Traffic Management Centre, Sub-Centre and the field equipment in their own name. All the expenses charged by Power Companies regarding such applications and execution of work shall be borne by the Concessionaire as part of the scope of this contract. Any damage to the highway during such execution of work shall have to be repaired by the ATMS Concessionaire to the pre-existing condition without any cost implications to NHAI.
- The Concessionaire shall make all necessary arrangements for the electricity needed for the execution of the Works and O&M period for the entire period of the Contract. In case electricity is not made available through electricity companies, alternate electricity arrangement such as through renewable energy/DG Set should be made by the Concessionaire. Under no circumstances NHAI shall grant an extension of time for achieving the milestones if the Concessionaire is unable to make the electricity arrangement either for the execution of the work or for the O&M activities.
- The fixed charges, installation charges, recurring charges, electricity bill, DG set fuel, maintenance etc. for each field equipment, TMC, Control Centre, Sub-centre, Concessionaire's site office, or any other facility being used by the Concessionaire under the scope of this Contract shall be in the scope of the Concessionaire only for the entire Contract period i.e., Design phase, procurement, installation, testing, trial-run, commissioning, operations, and maintenance period. The Authority shall not be responsible for any provision for power supply during implementation as well as operations and maintenance period.

6.10.8 Operation & Maintenance (O&M) of the entire ATMS Facility.

- The O&M period after the successful completion of works shall include Operation & Maintenance of the entire ATMS Facility as per the Service Level Agreement (SLA) with Qualified Manpower mentioned in Standards & Specifications including supply of adequate spares, parts, consumables and maintenance equipment required for the facility. The Concessionaire shall maintain required spare parts to maintain required service levels.
- The Concessionaire shall have sufficient infrastructure and capability to keep/store spares required for maintenances and will at all times during the contract period maintain sufficient inventory of spares and consumables for operating and maintaining the ATMS and to meet the Service Level requirements.
- Before the start of O&M Period, the Concessionaire shall deploy the O&M Personal mentioned at Appendix-C of Standards & Specification (NHAI Policy circular no. 11.53/2023 dated 10.10.2023) with prior approval of the Authority.

Maintenance Vehicle- The Concessionaire shall keep adequate numbers of dedicated vehicles (minimum 1 vehicle per 50km) to attend the maintenance requirement during the Operation & Maintenance period.

CHAPTER-7

ENVIRONMENTAL ASSESSMENT

7.1 ENVIRONMENTAL IMPACT ASSESSMENT

The environmental impacts associated with the proposed up-gradation are construction related impacts associated with road widening projects. These are proposed to be addressed through good engineering practices and adoption of environmental management measures proposed in the Environmental Management Plan (EMP) for the corridor. **The EMP budget for this project road** include the management measures and provision for environmental monitoring.

Table 7.1: EMP Cost

S. No.	Component	Item	Unit	Quantity
1	Legislation, Permits and Agreements	Consent to Establish and Consent to Operate for plants and machinery of the contractor		
2	Flora	Clearing of Road side plantation	Km	45.645
		Compensatory Afforestation (minimum 10 trees planted for every tree cut)	No.	343070
3	Environmental issues at construction sites	Sanitation Arrangement at Camp	Lump sum	
		Dust Suppression Measures	Km	
		Labour camps, health and other service	Lump sum	
		Solid Waste Management	Lump sum	
		Environmental Management Training and Awareness Programme	Lump sum	
		Installation of oil separator at car washing area	No	2
4	Rain Water Harvesting	Rain water Harvesting Structures	No.	0
5	Environmental Monitoring	(a) Ambient Air Quality monitoring of PM ₁₀ , PM _{2.5} , CO, SO ₂ & NO ₂ (Quarterly in two locations for two years)	No.	16
		(b) Ambient Noise level monitoring (Quarterly in two locations for two years)	No.	16
		(c) Water Quality monitoring of surface water (Quarterly in one location for two years)	No.	8
		(d) Soil Quality monitoring of Agricultural lands (Quarterly in one location for two years)	No.	8
		(e) Monitoring of drinking water/ground water once in month (Quarterly in one location for two years)	No.	8
1	Environmental Monitoring	(a) Ambient Air Quality monitoring of PM ₁₀ , PM _{2.5} , CO, SO ₂ & NO ₂ (Once in quarter for one year in one location)	No.	4
		(b) Ambient Noise level monitoring (Once in quarter for one year in one location)	No.	4

		(c) Water Quality monitoring of surface water (Once in quarter for one year in one location)	No.	4
		(d) Monitoring of ground water (Once in quarter for one year in one location)	No.	4
		(e) Soil Quality monitoring (Once in quarter for one year in one location)	No.	4

7.2 LAND ACQUISITION AND RESETTLEMENT IMPACTS

Being a greenfield alignment, there is no land width available. For proposed Project highway width as per TCS will be required. PROW section can be referred to for details.

A resettlement budget including compensation for the affected land & structures, assets within the affected properties and rehabilitation and resettlement assistance has been included in the estimate. Any unforeseen impacts on resettlement during implementation will be taken up in accordance with the Resettlement Policy Framework (RPF) of the Project.

Table 7.2: Summary of Land Acquisition

Sr. No.	Items	Area in HA.
1	Total Land Required	452.24

It is evident that the above-mentioned land is desired for the development of the project highway, the number of affected structures & land loosening impact on the owners are some of the key points to be taken care in Environmental & Social Impact assessment. Impact of the tree felling across the project alignment has been suitably assessed and remunerated back to Mother Nature by mandatory afforestation measures. These measures are discussed in detail in Environment Management Plan for the project Road development.

CHAPTER-8 COST ESTIMATE

8.1 General

Cost estimation is an important component of the study as it provides insights for proper planning of project execution. Detailed Cost estimates are prepared based on the detailed engineering designs and detailed drawings.

8.2 Quantification

The construction items covered in cost estimates include are as follows:

1. Site clearance & Dismantling
2. Earthwork
3. Sub-Base, Base Courses (Granular)
4. Bituminous Courses / Concrete Pavements
5. Cross Drainage Structures
 - 5.1 Culverts
 - 5.2 Minor Bridge
6. Drainage & Protection Works
7. Traffic Signs, Road Markings & Appurtenances
8. Miscellaneous

The items of work have been given only in summarized form without detailed description of work and materials. All individual items however have referenced to the relevant Sections/Clauses of Specifications. The Specification Clauses cover input details, method of construction, mode of measurement etc.

8.3 Centages

As per MoRT&H circular on HAM mode, the Cost estimates incorporate other provisions besides the Civil works and comprises of following parts as under:

- i. IC/pre-operative expenses @1% of C
- ii. Financing Cost (1% of debt amount)
- iii. Interest during Construction
- iv. GST - @18% of Estimated Project Cost
- v. Labour Cess (1% of Estimated Project Cost with GST)
- vi. Contingencies @ 1% (on Cost Put to Tender)
- vii. Agency Charges @3% (on Cost Put to Tender)
- viii. Supervision Charges @ 3% (on Cost Put to Tender)
- ix. Escalation @5% for 1 Year (on Cost Put to Tender i/c utility shifting)
- x. O&M Cost for 15 years as per Ministry OM dated 23.05.2022

8.3 Rate Analysis and Cost Estimate

Rates have been considered **based on the rate calculation using MoRTH Standard Data Book (using basic rates of items as per Meghalaya PWD SOR 2019-20 & for the items not found in Meghalaya SOR, Assam PWD SOR 2020-21 has been used), Market Rates, direct rates from SDB wherever applicable and latest NHAI policy circulars/guidelines related to Road Safety and allied**

works.

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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Table 8.1: Cost Abstracts-As per RFP

	DEVELOPMENT, MAINTENANCE, MANAGEMENT AND OPERATION OF GREENFIELD HIGH-SPEED CORRIDOR FROM MAWLYNGKHUNG (NEAR SHILLONG) IN MEGHALAYA TO PANCHGRAM (NEAR SILCHAR) IN ASSAM BY 4-LANING WITH PAVED SHOULDERS ON HYBRID ANNUITY BASIS. PKG-01 DESIGN LENGTH – 45.645 KM	MAIN REPORT (DPR)
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8.3.1 Lead calculation summary for preparation of Rate Analysis and Cost Estimate

Leads are necessary to be accommodated for arriving at appropriate rates against each item. Necessary leads and final cost with respect to basis input items are presented below: -

Table 8.2: Lead of Materials

As per Meghalaya SOR