PROJECT APPRECIATION

3.1 Background and Introduction

MORT&H through National Highways Infrastructure Development Corporation Limited (NHIDCL) has intended to take up Feasibility Study and preparation of DPR for two laning of Akajan-Likabali- Bame road from Km. 65 to Km 97 (32 Kms length) in the state of Arunachal Pradesh under Arunachal Pradesh Package of SARDP-NE on EPC mode. This section of road is part of 105.6 Km long Akajan (in Assam NH 52) to Bame in Arunachal Pradesh via Likabali. Theotech Projects Services Pvt. Ltd in association with AIAID Pvt. Ltd. the Consultant, is awarded this consultancy assignment and the contract agreement is signed with NHIDCL, which is the implementing and executing agency for the project.

This chapter of the Inception Report deals with the Project Appreciation, including socio-economic profile of the state, site appreciation and after having carried out site reconnaissance survey in first week of August 2015. This in turn will assist to preparation of appropriate Approach and Methodology for the project in the next Chapter of this report.

3.2 The Project Road

The road section from Km65 to Km 97 ( length 32Kms) part of Akajan – Likabali- Bame road about 105.6 Km in length is sub project of SARDP –NE , Arunachal Pradesh package. The Arunachal Pradesh package of the project covers about 2319 Kms of roads, of which 1472 Km are National Highways and 847 Km. are State Roads.

This 32 Km. project road section of Akajan – Likabali- Bame road, forms part of 847 Kms long project, which is, provides Improvement of State Roads to 2 lane standard for providing lane connectivity to five district headquarters in Arunachal Pradesh.
EXECUTIVE SUMMARY

1.1 Introduction and Back Ground

Akajan – Likabali - Bame Road is part of SARDP-NE project, which starts from NH 52 at Akajan in Assam and enters in to Arunachal Pradesh at Likabali, traverses through district West Siang of the state.

MORT&H Govt. of India invited technical and financial proposals from the Consultants to carry out consultancy services for Feasibility Study and preparation of Detail Project Report for two laning of Akajan - Likabali - Bame Road from Km 65.0 to Km 97.0 (32km) in Arunachal Pradesh as a part of SARDP –NE project, Arunachal Pradesh Package

Theotech Project Services (P) Ltd in association with AIAID, (the Consultant) have been awarded the above mentioned services through competitive bidding. The Consultancy Contract Agreement is signed between the Consultant and the National Highways Infrastructure Development Corporation Ltd. (NHIDCL) Govt. of India Company, under Ministry of Road Transport and Highways (MORTH), as the NHIDCL is entrusted with the implementation and execution of the project.

1.2 Summary

The road to be developed to two lane carriage way width of 7m with shoulders on either side and provision of drain to be on hill side and parapet on valley side.

The project road section starts from km 65 at village Riloo and passes through villages Echo at km 72, Nicra at km 75 and Basar at km 97. The road sections from Likabali to km 65 and beyond km 97 to Bame are already under execution for up gradation.

Total land width required for ROW is 24mts. While the available ROW is ranging from 12 m to 15 m which requires land acquisition to the tune of 9 m To 12 m

This feasibility study report of the project comprises following:

- traffic surveys and analysis
- Condition survey of Road and bridges & CD Work
- Inventorization of Road, bridges, CD works and other Structures
- Preliminary Socio Economic Profile of Project area
- Topographical survey, Strip plan
- Soil & Material Investigation, Sub grade investigation & pavement investigation.
- Geo tech and subsoil investigation.
- Evolving design standards and technical specifications.
- Environmental screening
- Hydraulic Investigation
- Initial social assessment preliminary land acquisition & resettlement plan.
- BOQ and cost estimation
- Economic analysis.
Traffic Surveys were carried out for consecutive three days for (3* 24) hours along with Origin Destination survey and axle load survey for 24 hours. The traffic count has been observed as low when compared to the standard traffic carrying capacity of two lanes. The traffic survey details and analysis is provided in section 6.

Condition Surveys of Road, Bridges and CD works, has been carried out. The condition of road is seen to be very poor with ruts, pot holes and cracks. The existing carriageway width of the road is about 3.5 m. to 4 m. and the same is proposed to be widened to 7 m. with soft shoulders.

There are three major/minor bridges at 71/650 (on Ego River), 74/694 (on Ichi Nallah) and at 96/600 (on Kidi River), which are in good condition and can be retained. The CD works including box culverts, pipe culverts and causeways are mostly blocked with silt. The pipe culverts and causeways are proposed to be replaced with RCC culverts and the existing culverts in good condition to be widened to 11 m.

Inventory of bridges and CD works are provided with the report as

Topographic surveys are carried out with Total Station Equipment, to capture the levels of the road alignment within a corridor of 50m. The cross sections are plotted at every 20 m. The curves with radii smaller than 14m. have been plotted at 10m Cross sections each. The profile of the road alignment is drawn to know and to suggest improvements in gradient of the road, along with the improvement in Geometrics of the road.

The sharp curves/ hair pin bends are proposed to be improved with better radii and sight distances. Several sections of the road have been proposed for realignment/ short by passes to improve horizontal and vertical geometrics.

Three options of alternate alignments are studied to avoid steep gradients near Everest village. And these alternate alignment options are as follows:

(i) Option1. Via Village Disi, Regi and existing PMGSY road, km 79- km 97
(ii) Option2. Via Village Kamdek, between chainage km 80- km 87
(iii) Option3. Via Everest village falling on left hand side of the existing road (Likabali to Basar) between KM 85- KM 89

Out of these three options, option No. 3 that is realignment section from km 85 to km 89 is found suitable & practical for execution. This way the steep gradient near Everest village is set aside, hence the option No.3 is recommended for finalisation. However there are going to be several other aspects which need attention for considering and finalizing this alignment for execution.

The aspects of cost of construction of realignment section is going to be very high, earth work in excavation will be huge, the excavation through virgin land/ hills will require cut through high hills, even to the extend of about 40-50 m or more.

The realignment section from km 85-km 89 will be required one major bridge of about 100m length to be constructed. Thereby increasing cost of this section of the project many fold.

Taking these points into consideration, the client needs to take a decision for execution.
Improvements in the existing alignment of the project road with increase in radii of the sharp curves to improve sight distances and softening of gradient wherever possible, so that the curves radii and the gradients are maintained as per IRC SP 73, Standards and Specifications for Two-laning of State Roads. This way improvement of existing alignment can be one of the option for execution. While comparing two alignments that is one with bypass from km 85-km 89 and the other through existing road, the cost of the project can play an important role in deciding the final alignment for execution.

Also, having discussed with GM, Itanagar all the three options and it is found that the most suitable options of alignment can be option No.3 and option No.1, keeping in view the requirements of improvements in gradient and the sight distances along the project, except for cost of the project which goes in favour of option No. 1 only.

**Strip plan** is prepared which shows existing features of the road like details of the curves, existing carriageway width, existing utility lines, trees within the roadway width, existing ROW and proposed ROW. Improvements including widening plan proposed for the project road are shown in the strip plan. The plan and profile are attached along with the report.

**Environmental screening and preliminary Social Assessment** are carried out to assess the impacts and to propose the mitigation measures. The improvements and up gradations are proposed with minimum impacts on the environmental and social issues. Reports on environmental screening and Preliminary Social Assessment are given in sections 8 and 9.

**Design Standards and Specifications** have been indicated as per the IRC codes and MORTH Book of Specifications for Roads and Bridges. Accordingly the typical cross section drawings are prepared and attached with the report.

**BOQ and Estimates** are prepared with the SOR of Arunachal Pradesh PWD. The provision for land acquisition as per requirement of 24 m. ROW has been kept. Provision has been made for widening of bridges to standard two lanes, replacement of Hume pipe culverts and causeways by RCC/ box culverts and additional drainage and cross drainage requirements.

Provision for protection works by way of constructing breast walls and retaining walls have been made. Cost Estimates includes items related to road safety, road furniture and road signs.

The **economic analysis** based on the traffic surveys, cost estimate, vehicle operating cost, benefits from the project after improvements have been carried out. Though the value of EIRR is not upto the required number, the up-gradation is carried out under the SARDP-NE project to provide connectivity to the remote areas with other parts of the state and the country, which can provide better riding quality to the users and multiple opportunities for development of the North Eastern region of the Country. While comparing various options for improvements of alignment of the project road it seems that the road through the existing alignment is more appropriate and economical. However to obviate the alignment through the steep gradient near Everest village, the option No.3 can be taken into consideration, though its cost can be on higher side, as it involves huge excavation and construction of one major bridge.
MORTH ORGANIZATION and SARDP-NE PROGRAM

MORTH is the Government Organization to develop the National Highways and other important Roads of India, by way of planning, preparation of feasibility reports, detailed project reports and execution. National Highways Infrastructural Development Corporation Limited (NHIDCL) has been created as an autonomous body under MORTH to develop roads in North Eastern States and other hilly states.

SARDP-NE Program is a Special Accelerated Road Development Program, a major road development program for North Eastern States. The objective of this project is to upgrade to two/ four lanes, the National Highways connecting state capitals and to connect the 88 district headquarter towns by at least two lanes roads. Also the objectives include improvement of strategic roads in the border areas.

The program has been placed in three phases, and these are : Phase A, Arunachal Pradesh Package and Phase B.

The Akajan – Likabali - Bame road falls in state roads of Arunachal Pradesh package of the program, which comprises total 2319 km, including 1472 km of NHs and 847 Km of state roads and strategic roads.

SECTION 3: PROJECT DESCRIPTION

Two laning of road section from Km 65 to Km 97 (32 km. length) in the state of Arunachal Pradesh is part of 106 km long Akajan- Likabali- Bame road, which starts from NH 52 at Akajan in Assam and goes upto Bame in Arunachal Pradesh.

The state road from Akajan to km 65 and beyond km 97 is under execution for development to two lanes by either Border Roads Organization (BRO) or NHIDCL.

The project road starting from km 65 at village Riloo has existing width of 3.5m to 45 m and passes through villages , Echo, Nicra, Dali, Padi and Basra at km 97. The road traverses through hilly terrain with
some sharp curves and deficient sight distances and steep gradients. Condition of the road is poor in terms of riding quality and safety issues, which needs up-gradation and improvements to its geometrics.

The existing condition of the pavement of the road is very poor, which is full of pot holes, ruts and cracks in the surface. There is no effective drainage due to blocked drains on the hill side of the road and most of the culverts are partially or fully blocked due to silt accumulation, The road edges are broken with damaged shoulders.

It passes through the villages as mentioned below:

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Location in KM</th>
<th>Name of Village</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>65.00</td>
<td>Riloo</td>
</tr>
<tr>
<td>2</td>
<td>71.50</td>
<td>Echo</td>
</tr>
<tr>
<td>3</td>
<td>74.90</td>
<td>Nicra</td>
</tr>
<tr>
<td>4</td>
<td>75.00</td>
<td>Dali</td>
</tr>
<tr>
<td>5</td>
<td>79.00 to 81.00</td>
<td>Padi</td>
</tr>
<tr>
<td>6</td>
<td>97.00</td>
<td>Basar</td>
</tr>
</tbody>
</table>

There are three major/ minor bridges, 189 slap/ box culverts, 9 HP culverts and 5 causeways along this section of the road.

Though there are no major intersections/ junctions in this road section, there are some minor junctions with the village roads.

While carrying out surveys, reconnaissance was done to look for any bypasses and realignments so as to improve the gradients and sharp curves. Accordingly, there are improvements proposed for improvement in radii of sharp curves.

GENERAL MANAGER
NHIDCL, (MORT & H)
PROJECT, NAMSAI (A.P)