

Study and Application in Renovation of Hill Transport

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Abstract: To study and analyse the existing pavements by means of using several methods. Generally, it is an idea to renovate the pavement when there is some possibilities. This study is concerned to predict the existing road in hill station. The work initially starts from survey on existing pavement and their condition i.e., it may include culvert ,pavement dimensions, road width etc., After the process of surveying we use L.S and C.S method to find the road level. It may help to make the horizontal alignment upon the road. Finally, the designing process is carried out. At pavement design ,we consider number of conditions over the project. This study mainly notifies whether any possibility to renovate the existing roads and also we used some software to analyse the data regarding the pavement. The application of this project are 1.Minimum distant 2.Easy accessible 3.Time consideration. Apart from that we have refered several journal to gain some ideas in renovation and also gave possible advantages over renovation of pavement.

Keywords: Renovation, Pavement, Hill station, Horizontal alignment, Survey.

I. INTRODUCTION

The project deals with the study and application in renovation of hill transport. Hill roads are normally in bedraggled condition due to heavy rain and improper maintenance for several years. An efficient hill transport system is a prerequisite for sustained development. This project briefs the design aspects, factors involved and application of renovation.

A. Objectives:

1. To avoid heavier traffic congestion.
2. Higher utility level of passengers.
3. Low cost and opportunity cost.
4. Good slopes and curves.
5. To provide retaining wall, hairpin bends, culverts in necessary spots of road.

II. DEFINITION OF RENOVATION AND HILL ROAD:

A. Renovation:

Renovation is the art of renewing or restoring. Derived from the LATIN word in which “re” refers “again” and “novera” refers “make new”. In other words it is a remodeling technique for improving broken, damaged or outdated structure.

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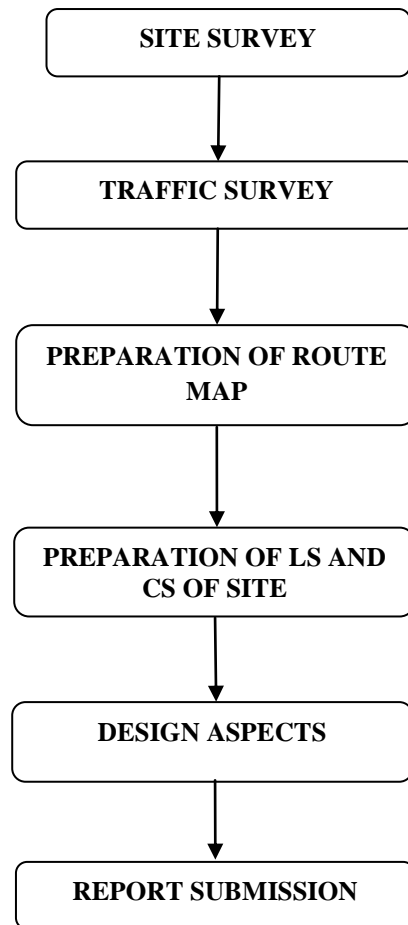
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B. HILL Road:

Roads found at the mountainous region that passes through distinctive terrain with the cross slope of 25 percentage or more.

III. METHODOLOGY



IV. TRAFFIC SURVEY DETAILS

Traffic census particulars are not available for the road. As the condition of the road at present is pathetic, Traffic survey cannot be conducted for the road. Hence for the purpose of the pavement design 25% of the traffic plying on current communicational road as be assumed in this estimate.

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For Kodai Ghat Road (SH-156)

Census Point	Year of Census	Influenced Stretches	CVPD	PCU	Peak / Normal
Km 46/10	2014	Km 0/0 – 54/2	4522	16143	Peak

Table. 01(Traffic Survey)

Assumed Traffic for Periyakulam – Kodaikanal Road (via) Adukam

Census point	Year of census	Influenced Stretches	CVPD	PCU	Peak / Normal
Assumed	-	Km 10/8 – 35/9	1130	4692	Peak

Table.02 (Traffic survey)

V. SITE SURVEY DETAILS

Stretch in Km	Existing road width (m)	Formation width (m)	Present condition		
			WBM (mm)	BASE (mm)	BT (mm)
Km 16/2 – 17/0	3.75	5.8	150	225	Fully eroded
Km 17/0 – 18/0	3.20	5.5	150	225	Partly eroded
Km 18/0 – 19/0	3.40	5.6	150	225	Partly eroded
Km 19/0 – 20/0	3.00	5.5	150	225	10
Km 20/0 – 21/0	3.30	5.4	150	225	Partly eroded
Km 21/0 - 22/0	3.20	5.5	150	225	Partly eroded
Km 23/0 - 24/0	3.00	5.0	150	225	Partly eroded
Km 24/0 – 24/700	3.00	5.0	150	225	Fully eroded

Table .03 (Site Survey)

VI. PREPARTION OF ROUTE MAP



Fig.01 (Route Map)

VII. DESIGN OF PAVEMENT

Typical Cross Section From CH:16/2 to 24/7

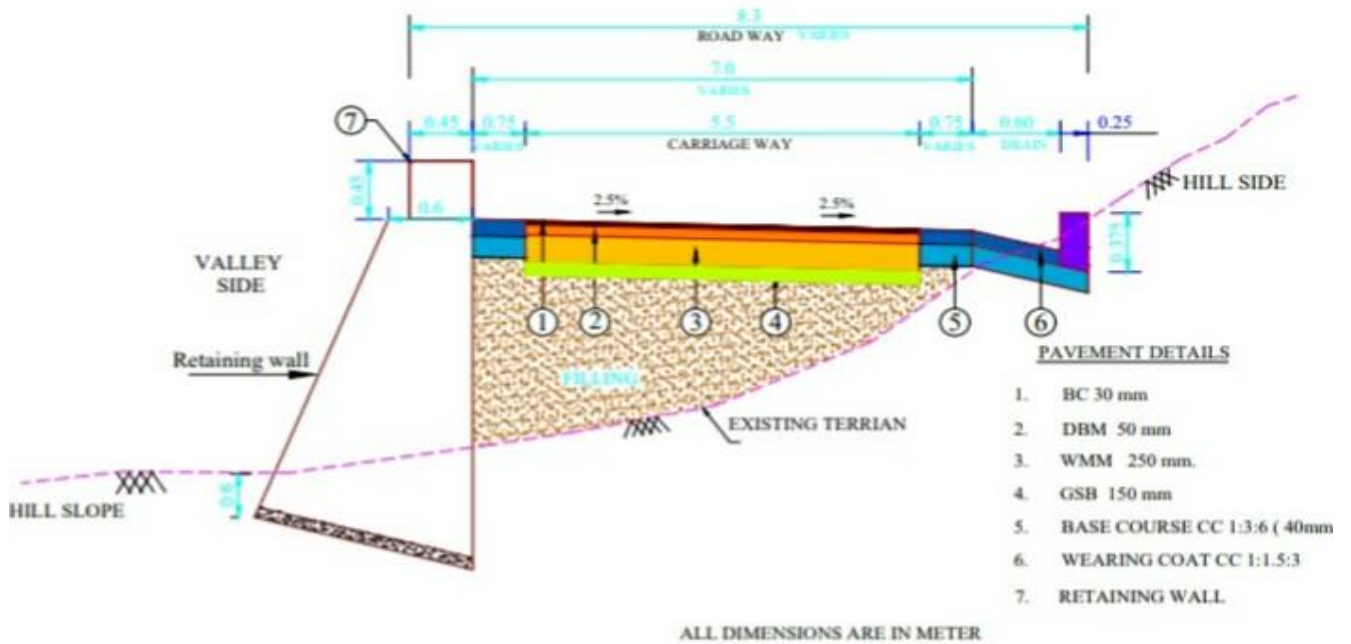


Fig .02 (Pavement)

VIII. DESIGN OF HAIRPIN BEND

There are seven hairpin bends are excites on the stretch. As per IRC-52-2001 (Recommendation about the alignment survey and geometric design of hill roads), Hairpin bends are should be designed.

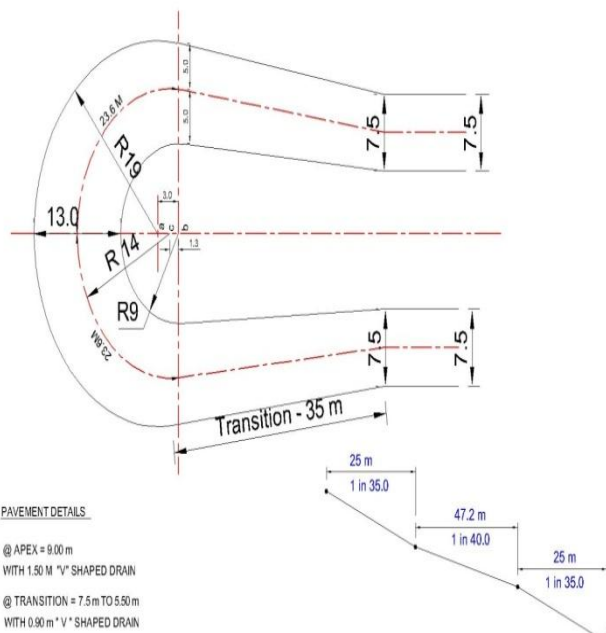


Fig.03 (Hairpin Bend)

IX. DESIGN OF RETAINING WALL

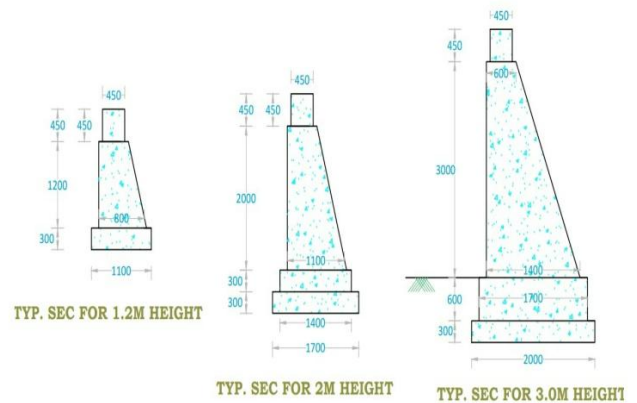


Fig.04 (Retaining wall)

Retaining wall is the structure use to avoid landslide on hilly region, and also it will be used for withstand the pavement.

Limit state method is used to design the retaining wall. (IS-14458(part 2): Retaining wall for hill Area – Guidelines, part 2: Design of Retaining/Breast walls) which is the code book used to design cost effective retaining walls.

X. CONCLUSION & FUTURE SCOPE

The key to a successful project is in the planning. Creating a project plan is the first thing we have done before undertaken this project.



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Initially we consider two aspects site survey and traffic survey. The former involves analysis of road width, transition curves, soil type, hairpin bends and damaged culvert. Whereas for the latter we have chosen an already existing hill road as of 25% and designed the pavement, hairpin bend, retaining wall. Having followed all the steps mentioned above we have made a study in hill transport renovation.

FUTURE SCOPE

- Reduces travelling time.
- Avoid accidents.
- Facilitates a better way for commercialization of tangible goods.
- Easy accessible.
- Favors the tourist people thereby satisfying their needs to the best.

REFERENCES

1. "Widening and Renovation of Hill Road Pavement" by P.Gowtham, K.Mahendran, R.Vignesh, R.Priya, V. Mathavan and Dr. D. Vijayalakshmi.
2. "Road Renovation and Maintenance: a case study of East Coast Road Project" by ThillaiRajan A.