

RESEARCH ON FLEXIBLE PAVEMENT FAILURES ON DODA BHADERWAH ROAD (NH-1B)

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Abstract - This Study is a survey to evaluate the flexible pavement conditions to determine and specify the types of the failures in the pavement for the selected highway. It is very significant to evaluate and identify the causes of the flexible pavement failures and select the proper and best treatment and maintenance. The study had two major and critical goals which covered by considering the following three tasks, the first was the visual evaluation and inspection of existing flexible pavement conditions including the failures the second to determine and find out the actual treatments and maintenance types. As a case study, of Bhaderwah to Doda road (NH-1B) was selected for evaluation and inspection purposes. The field evaluation works were achieved on the existing flexible pavement conditions of the selected rural highway. The result were most of the damages and failures in the pavement are serious and extreme surface deformation, cracks disintegration, and surface defects.

Key Words: Pavement Conditions, Flexible Pavement, Surface Defects, Cracks Disintegration, Rural Highway

1. INTRODUCTION

Transportation infrastructure plays a lead role in economic growth and development of country.

India has the second largest highway and road network system in the world. They carry almost 90 percent passenger traffic of our country and 65 percent of freight. Most highways in India are narrow and congested with poor surface quality. Though highways are well designed as well as properly constructed but still it may require maintenance, the extent which will depend on several factors including the pavement type. The functional deterioration is indicated by the changes in surface condition of the pavement in the form of deterioration in the riding quality, which can be measured by simple methods; it is also possible to restore the surface to original condition of the pavement by providing a profile correction course and a resurfacing layer. Scope of transportation system has developed very largely.

1.1 Study Area

The condition of pavement between Doda to Bhaderwah is not good enough so that it requires Some maintenance and rehabilitation. Road length of 20.0kms from Doda to Bhaderwah (NH-

1B). It is the only road which connects Bhaderwah with Himachal Pradesh. The nearby area is

Mostly agricultural land and remains irrigated throughout the year. Many schools, marriage halls,

Colleges and residential areas are existing on the stretch, so the traffic volume will increase year by Year. There are many college buses, loaded trucks, tractors, public transport travelling 24 hours on the length of road. So the pavement condition shall deteriorate under failing circumstances and Unsafe for road users due to heavy traffic.

1.2 METHODOLOGY

The objective of this study is to establish guidelines describing systematic method for inspection and evaluation of pavement failures and to find out the possible causes of these failures. The proposed method has some basic steps as follows:

- i. Inspection and Evaluation Plan
- ii. Pavement Condition Survey
- iii. Experimental work
- iv. Determine Probable causes of Failure

2. Inspection and Evaluation Plan

Planning is important to ensure that inspection and evaluation of pavement failures were carried out their intended tasks within a reasonable time frame and at the lowest cost.

When planning the evaluation program, a general review of the problem should first be conducted, along with the possible scope of inspection and maintenance work that may need to be carried out. This plan should be drafted, addressing goals, budgeting constraints, operations planning and the investigative synthesis. The technical team should be decided upon.

2.1 Pavement Condition Survey

The pavement condition survey may include visual examination of pavement failures, the effectiveness of drainage structures and other details such as topography and alignment should be recorded, and the soil and geology of the surrounding areas may also be of importance in determining the causes of the pavement failure. An effective visual survey of pavement failures is essential, to ensure that the cause of the failure can be diagnosed efficiently and it is a guide to what testing should be carried out and where. Distress surveying should be carried

out on failed pavement sections to find out the amount, type, and condition or severity level of distress, as well as the condition or effectiveness of any previously applied distress treatments.

2.2 Experimental work

The experimental work includes field and laboratory testing. Field testing program can assess the strength of the pavement materials. The conventional field tests may be carried out include

Benkelman Beams, Dynamic Cone Penetration (DCP) test, roughness and surface evenness measurement, skid resistance testing. Coring on pavement structure may be used to provide material samples for laboratory testing, and also allows visual examination of pavement layers.

Laboratory testing should be conducted on representative samples taken from pavement layers to determine physical characteristics of the materials. The tests on soils and aggregates may aim to measure the index properties by particle size and shape, the plasticity and specific gravity and to assess the strength by the compaction and California Bearing Ratio (CBR) tests. Geotechnical tests may include measurement of the shear strength, consolidation and determine the water level during site investigation.

Field and Laboratory

Tests Following tests were conducted during the course of this study:

- a). Sieve Analysis
- b). Los Angeles Abrasion Test
- c). Modified Procter Compaction Test
- d). In situ Density Test (Sand replacement method)
- e). DCP Test (In situ and soaked condition)
- f). Laboratory CBR Test (Soaked condition at in situ density).

3. CONCLUSIONS

Some causes of road cracks and deterioration and defects are due to poor construction quality, structural failure of base, poor highway facilities, poor maintenance policy, poor supervision.

Pavement deterioration process starts very slowly so that it may not be noticeable, and over the time it accelerates at faster rates, there must be implementation of the proper maintenance and repair work in suitable time; which will maintain the pavement in a safe and acceptable operational condition and helps to save cost of maintenance.

Road maintenance is one of the important components of the entire road system. Even if the roads are well designed and constructed, they may require maintenance. Repair and

maintenance procedures cannot overcome bad design problems but can help prevent these problems resulting from degradation.

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