

## **Analysis and Execution of Road Work on Nh-5**

<sup>1</sup>P BHAVANA <sup>2</sup>A TONY DAVID <sup>3</sup>CH.MANIKANTA REDDY

<sup>1</sup>PG Scholar, Department of civil engineering, Anurag Engineering College,kodad.

<sup>2</sup>ASST.Professor, Department of civil engineering, Anurag Engineering College,kodad.

<sup>3</sup>ASST.Professor, Department of civil engineering, Anurag Engineering College,kodad.

### **ABSTRACT:**

Road transport is vital to India's economy. It allows the transport sector in the country, contributing to 4.7 percent of GDP in India, compared to lane, which contributed 1 percent in the period 2009-2010, despite the fact that the Rail passenger and net cargo agreement. Road transport has gained in importance in recent years despite the obstacles and large mansions in the articulation of the burden between the state and the movement of passengers compared to rail and air. The Indian government considers important aspects to the needs of development and social security and the integration in the country of the network of the country. The road network in India owns more than 65 percent of goods and about 85 percent of passenger traffic. India's road network is administered by different government authorities, given the form of the federal government of India. National roads linking capital cities, points of interest, ports and places of strategic importance to different countries. Although the national road 2% roads represent only the total length

of the road, and carry almost a third of the total traffic. Flexible paving material from the surface of the bituminous base layer and basic sub base courses is made up. Bitumen of materials is often asphalt, which allows a great plastic deformation of a viscous nature. Most of the asphalt layers built on a gravel basis, although some are asphalt layers "total depth" directly depending on the degree of subcontractors. Depending on the temperature being applied, it is classified as hot asphalt asphalt mix (HMA), hot asphalt, or a combination of cold asphalt. The so-called flexible pavements reflect the total pavement surface deviation of all subsequent layers due to pregnancy traffic accordingly. It is based on the flexible pavement in the distribution of the load of the design characteristics of the caste system. The load is transmitted to the subsoil through a set of classes. Flexible distributed load paving in a relatively small area of the seat layer underneath. The cost of initial sidewalk installation is very low elasticity and that is why this type of pavement is most commonly seen around the world. However, flexible pavement

requires routine maintenance and repair every few years.

## **INTRODUCTION:**

National Highway 5 (NH-5) is a major National Highway in India that runs along India's east coast through the states of Orissa, Andhra Pradesh and Tamil Nadu. The northern terminal is at Jharpokharia in Orissa and the southern terminal is at Chennai in Tamil Nadu. NH 5 is a part of the golden quadrilateral project undertaken by National Highways Development Project. Under the new national highway numbers NH 5 is renamed as NH 16. NH 5 runs for a distance of 1533 km. In Tamil Nadu NH 5 starts from Chennai and shortly enters Andhra Pradesh from Gummidipundi. In Andhra Pradesh, it passes through most of the coastal towns in nine coastal districts including Nellore, Ongole, Chilakaluripet, Guntur, Vijaywada, Eluru, Tanuku, Rajahmundry, Tuni, Visakhapatnam, Srikakulam, Tekkali and Palasakasibugga. In Orissa, it passes through Baripada, Balasore, Bhadrak, Cuttack, Bhubaneswar and Berhampur. Our project is on Six Laning of Chilakaluripet - Nellore section of NH 5 from km 1182.802 to km 1366.547 (approx length-183.620 km) in the state of Andhra Pradesh under NHDP to be executed as BOT project on DBFOT

pattern. The project was awarded to M/s. KMC-BSCPL JV. BSCPL share is 50 %. Classification of roads as per IRC (Nagpur Plan) National Highways: These are main highways running through the length and breadth of the country connecting major ports, foreign highways, state capitals, large industrial and tourist centers etc. State Highways: These are arterial routes of states linking direct headquarters and important cities within the state and connecting them with National Highways or Highways of the neighboring states. Major District Roads: These are important roads within a district serving areas of production and markets, and connecting these with each other or with the main highways. Other District Roads: These are roads serving rural areas of production and providing them with outlet to market centers, taluka/tehsil headquarters, block development headquarters, or other main roads. Village Roads: These are roads connecting villages or groups of villages with each other and to the nearest road of higher category. Geometric Design Standards The layout and other geometric features of a road have direct influence on the initial cost of its construction and the efficiency and economy of its use by traffic. The safety of operation is also significantly affected by geometric design. The geometric

design of a highway is influenced significantly by terrain conditions.

**Different road materials used:** The most important pavement materials are soils, mineral aggregates, bituminous binders, and stabilizers like lime, cement, etc. Mineral aggregates constitute about 90 percent of total volume of road construction materials used. All roads have to be founded on soil and are required to make optimum use of the locally available materials, if it is to be constructed economically. Materials used in the structural layers of the pavement should be selected based on availability, economy and previous experience.

**Soil as road construction material:** Sub grade soil is an integral part of the road pavement structure as it provides support to the pavement as its foundation. The main function of the sub grade is to give adequate support to the pavement and for this the sub grade should possess sufficient stability under adverse climatic and loading conditions. The formation of wave, corrugations, rutting and shoving in black top pavements are generally attributed to poor sub grade conditions. When soil is used in embankment construction, in addition to stability, incompressibility is also important as differential settlement may cause failure. Soil is used in its natural form (gravel and sand) or in a processed form (stabilized

layer) for pavement construction. Soil is also used as a binder in water-bound macadam layers. Soil is therefore, considered as one of the principal highway materials. The foundation of other cross-drainage structures (culverts, bridges and retaining walls) rests on soils and their stability depends on the soil strength, knowledge of soil properties is necessary to select the embankment material, pavement structure, drainage system and foundation of structures. When a high embankment rests on soft ground, its stability can be predicted by studying the properties of soil. Frost action, common in high altitudes, can be taken care of if the soil properties are well known. Soil consists mainly of minerals matter formed by the disintegration of rocks, by the action of water, frost, temperature, and pressure or by plant or animal life. Based on the individual grain size of the soil particles, soil have been classified as gravel, sand, silt, and clay. The BIS gives the following limits of particle size. Gravel 80-4.75 mm Sand coarse 4.75-2.00 mm Medium 2.00-0.475 mm Fine 0.475-0.075 mm Silt 0.075- 0.002 mm Clay

**Bituminous material:** Bitumen is a viscous liquid, semisolid or solid material, colour varying from black to dark brown having adhesive properties consisting essentially hydrocarbons is derived from distillation of petroleum crude or natural asphalt and

soluble in carbon disulphide. Bituminous materials used for paving purposes are penetration grade bitumen and liquid bitumen (cutbacks & emulsion). The bituminous binder should possess the following qualities.  $\frac{3}{4}$  Adequate viscosity at the time of mixing and compaction.  $\frac{3}{4}$  Not highly temperature susceptible.  $\frac{3}{4}$  Should not strip from aggregate in presence of water.

**Site clearance:** General: Site clearing generally consists of the cutting and/or taking down, removal and disposal of everything above ground level, including objects overhanging the area to be cleared such as tree branches, except such trees, vegetation, structures or parts of structures and other things which are designated in the contract to remain or be removed by others to which the engineer directed to be left undisturbed. The material to be cleared usually but not necessarily is limited to trees, stumps, logs, brush, undergrowth, long grasses, crops, loose vegetable matter and structure. The entire road area shall be cleared as described above, unless otherwise shown on the drawing and/or directed by the engineer.

**Setting out:** The right of way (R.O.W) shall be surveyed and set out before any site clearance is cleared out. Wooden pegs usually indicate the surveyed rights of ways.

Procedure for setting out: 1. Fixing of centre line of alignment by using total station, theodolite. 2. Calculating curvature and refractures(for curves and embankment) by using auto levels or dumpy level. 3. To establish traverse bench mark (TBM) at required intervals adjacent to alignments. 4. Location of levels at major conflict junctions. 5. To mark the longitudinal and cross sectional pavement structure. 6. To make efficient, minimum and desired sight distance at major conflicts and terrain and also setting out of horizontal curves throughout the alignment was done by using theodolite and total survey station.

#### CONCLUSIONS :

The general objectives are for the Concession Company to make the main NH5 road [and the service roads] as safe as possible for all users. The Concession Company shall follow [and shall also show it has followed] all relevant Indian publications on road safety, especially The Manual for Safety in Road Design (A guide for Highway Engineers) prepared in September 1998 for MOST. A formalised safety audit procedure must be followed [to optimise the safety process, and ensure safety is properly and formally considered] by the Concession Company during the detailed design [and during the Construction and post construction periods].

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