



**PLACEMENT & COMPACTION  
OF BITUMINOUS  
MIXTURES  
BY  
GREGORIADES THEMISTOKLIS**

**PROJECT REPORT**

Submitted to

The Department of Civil Engineering

Of the Higher Technical Institute

Nicosia-Cyprus

In partial fulfillment of requirements

For the diploma of

**TECHNICIAN ENGINEER**

In

**CIVIL ENGINEERING**

**June 2008**

HIGHER TECHNICAL INSTITUTE	PROJECT NO
	3778

# ACKNOWLEDGEMENTS

I would like to thank my project supervisor Mr. I. Economides, whose guidance and counseling helped me in the execution of this project report. Also I would like to thank Mr. Andea Gregoriades, Nemesis supervisor, for his helpful tips; my family and friends who gave me strength for the execution of this project report.

**Themis P. Gregoriades**

## **PREFACE**



This project has been prepared to provide essential information required for the quality control, placement and compaction of Hot Mix Bituminous Pavements for Cyprus roadways and not to introduce new methods.

The basic requirements for bitumen are adequate load carrying capacity (resistance to deformation) and durability. Surfacing mixes may also require particular surface texture requirements. Specific requirements for achieving performance attributes vary considerably with traffic loading levels, operating environment and underlying base conditions. This project does not attempt to introduce any new procedures but provides a guide to the placement and compaction of bituminous layers.

This project is concentrated on the upper two layers which make the surfacing; wearing course & base course. The layers underneath, are assumed to be in place, compacted, at the correct level and the operations for placement and compaction of hot bitumen are ready to start.

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## SUMMARY

The road user desires a road surface where he can drive safe and comfortable. This requires a pavement structure with enough stiffness, a fast run-off from the rainwater, an even road surface, a good reflection of (artificial) light at the road surface and a limited production of noise in the contact area between the vehicle tire and the road surface. These properties should preferably be present during a long period of time, e.g. during the life of the pavement structure, about 20 years.

Firstly, on the uniformly compacted road-base, hot prime coat is spread using a distributor truck. After 24 hours any excess is removed and the truck transport the hot bitumen for the first layer, base-course, at the place of placement at the correct temperatures. Base course consist of more porous materials than the wearing course, which means is cheaper. Using paver bitumen is placed and compacted with a roller and a pneumatic tire roller.

After 24 hours tack coat is spayed on the base course and now it is ready to follow the same procedure for the wearing course. Care must give to joints, because bituminous pavements deteriorate easily.

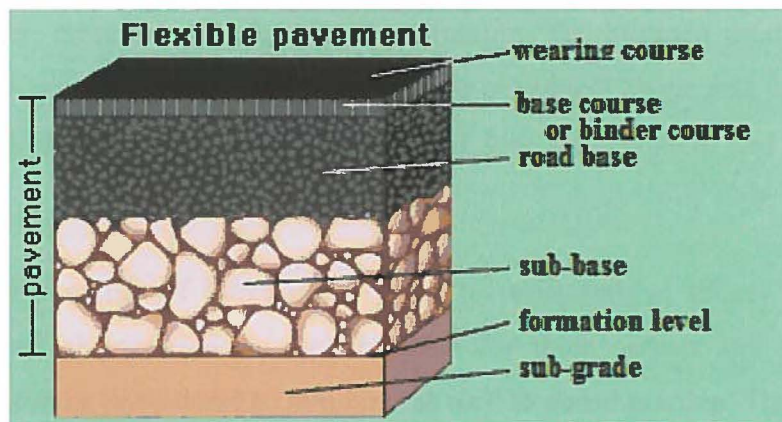
When compaction finishes core samples are taken of the pavement and sent to the laboratory for tests, so the pavements suitability certificates to print out.

## INTRODUCTION

The main purpose of the road structure is to provide a means of reducing the stress or pressure due to wheel load to a value which the ground under that structure can support. Flexible pavements are those which are surfaced with bituminous materials. These types of pavements are called "flexible" since the total pavement structure "bends" or "deflects" due to traffic loads.

A flexible pavement structure is generally composed of several layers of materials which can accommodate this "flexing". In general, a flexible pavement allows a small amount of vertical movement of the road structure under load.

A typical section of a pavement is shown below:



The purpose of wearing course:

- i. Provides a skid-resistant surface
- ii. Waterproof the pavement
- iii. Withstands the direct loading of traffic

For those three parameters the flexible pavement is very sensitive due to very important failures such fatigue failure, rutting failure and action of precipitation due to temperature changes.

The chapters followed remind the procedures and regulations for handling, placement and compaction of the mixture. A quick survey is done on the equipment and emphasis is given to the compaction. If compaction is not done properly different failures that are discussed occurs.