What shall we learn?

ROAD PAVEMENTS

- Road pavement types, pavement cross section, the components
- And how to prepare these layers?

Two most common types of pavements are referred to as

Flexible Pavement

And

Rigid Pavement

ROAD PAVEMENTS

RIGID PAVEMENT

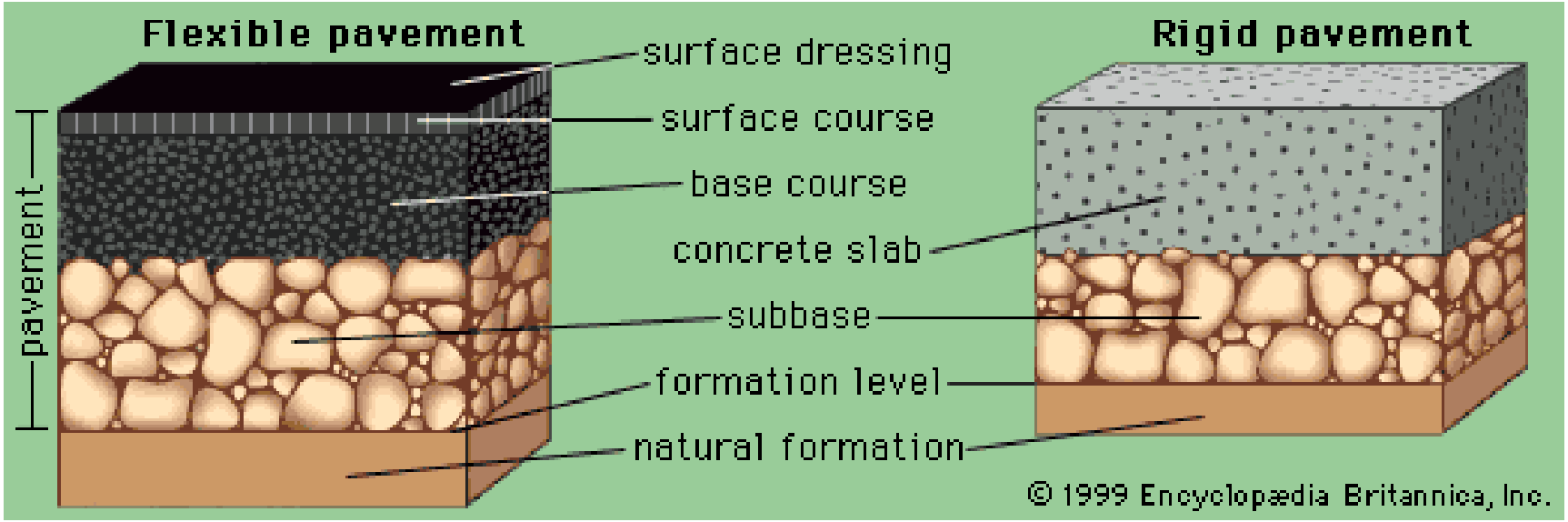
FLEXIBLE PAVEMENT

Flexible/Rigid Pavements?

•Flexible pavement can be defined as the one consisting of a mixture of asphaltic or bituminous material and aggregates placed on a bed of compacted granular material of appropriate quality in layers over the subgrade.

•A rigid pavement is constructed from cement concrete or reinforced concrete slabs.

ROAD PAVEMENTS



Differences

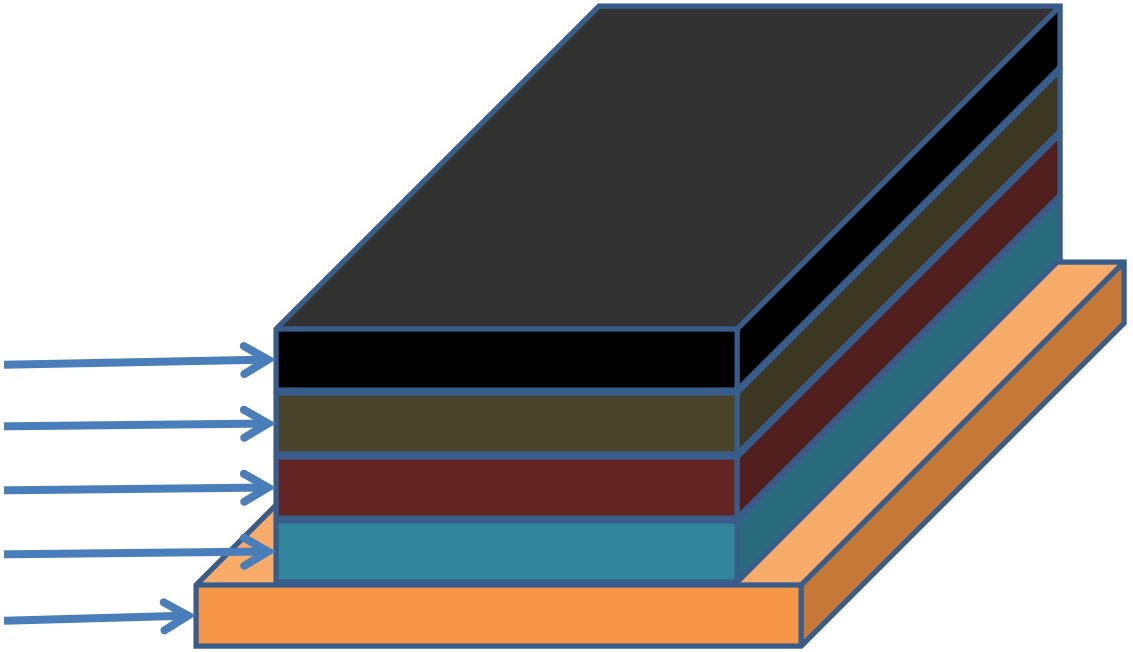
	Flexible Pavements	Rigid Pavements
What do they consist of	•It consists of a series of layers with the highest quality materials at or near the surface of pavement.	•It consists of one layer Portland cement concrete slab or relatively high flexural strength
Load Distribution	•Narrow and Deep	•Wide and Uniform

Differences

	Flexible Pavements	Rigid Pavements
Economics	•Low initial cost, Higher Maintenance Cost	•High initial cost, Low Maintenance cost
Other factors	• Short Lasting • Dependent on sub-grade strength	• Long Lasting • Quiet operations

Components

SURFACE COURSE
BINDER COURSE
BASE
SUB-BASE
SUB-GRADE



Components- Surface Course

•The top most layer in direct contact with the vehicular loads.
•Made up of good quality aggregates and high dense

•It is to provide skid-resistance surface, friction and drainage for the pavement. It should be water tight against surface water infiltration. The thickness of surface course generally provided is 25 to 50 mm.

Components- Binder Course

This is constructed using aggregates and bitumen but with less quality than materials used for surface course. In general, its thickness is about 50 to 100 mm.

The function of binder course is to transfer the loads coming from surface course to the base course

Components- Base

It distributes the loads from top layers to the underneath Subbase and sub-grade layers.

•It provides structural support for the pavement surface. (Minimum 100 mm)
•It is constructed with hard and durable aggregates which may either stabilized or granular or both.
•Drainage can be made within this

Components- Subbase

The Sub-base course is provided beneath the base course and it also functions as same as base course.

Granular aggregates are used to construct sub-base course. If sub-grade is weak minimum 100 mm thick sub-base course should be provided.

Components- Subgrade

Subgrade is the bottom most layer which is the natural soil layer compacted up to required depth (150 to 300 mm) to receive the loads coming from top layers.

The sub-grade should be strong enough to take the stresses due to the load coming from top layers.

Components- Coats

Seal Coat

Seal coat is provided directly on the top of surface course to make it watertight and to provide skid resistance to the surface. Mixture of Emulsified asphalt, mineral fillers and water is used as seal coat material.

Tack Coat

Tack coat is provided on the top of binder course to develop strong bond between the binder course and surface course. Asphalt emulsion diluted with water is used as tack coat material.

Prime Coat

Prime coat is provided between base course and binder course to develop strong and water tight bong between them. Low viscous cutback bitumen is sprayed on the top of base course as prime coat material.

Road Construction Process

Two videos illustrating on-field construction

ROAD PAVEMENTS

flex pavement.mp4

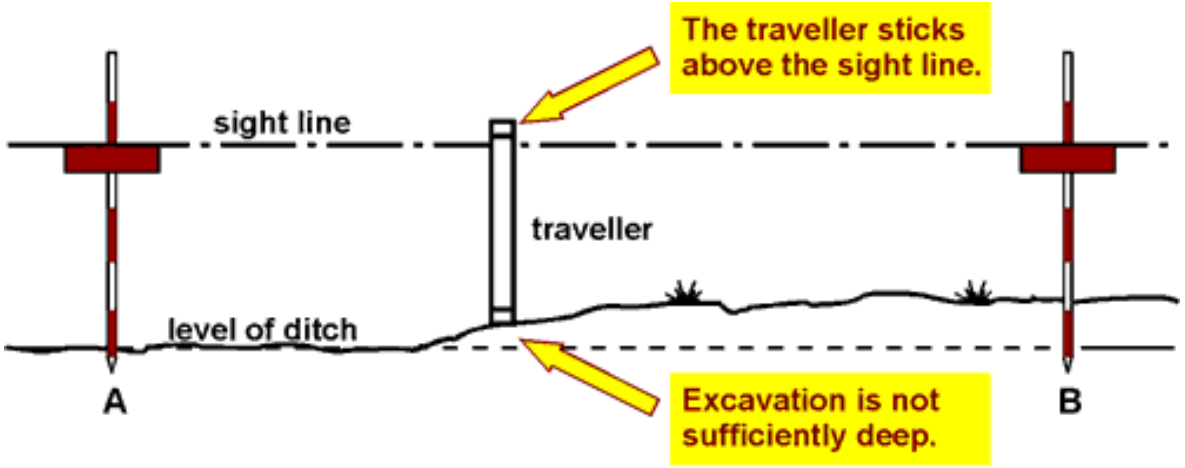
CP3 14 Flexible Pavement Construction.mp4

SUBGRADE PREPARATION STEPS

1. Setting Out
2. Dewatering – If stagnant water is present
3. Striping and Storing top soil
4. Compacting
5. Spreading material in layers
6. Bringing the appropriate moisture content
7. Compaction
8. Finishing operations
9. Fine grading

Road Construction Process

Setting Out



ROAD PAVEMENTS

Pavement on Poor Soil – Soil did not have adequate shear strength. Sub-grade soil had voids

Purpose of stabilization

Types of stabilization

a. Mechanical stabilization
b. Lime stabilization
c. Cement stabilization
d. Fly ash stabilization

Purpose of stabilization

To enhance the **Stability** or
Bearing power of the soil.

How to Stabilize?

- **Controlled compaction**
- **Adding proper stabilizer**

STABILIZATION

•It is the process of treating a soil in such a manner as to maintain ,alter or improve the performance of the soil as a constructing material.

•The changes in soil properties are brought by either mixing additives or by mechanical blending

PURPOSE OF STABILIZATION

- To improve the strength of sub-bases, base and in case of low cost roads, as a surface courses.
- To make use of locally available soil and other materials.
- To eliminate or improve certain undesirable properties.
- To control dust.
- To increase load bearing capacity of soil.
- To reduce compressibility and thereby settlement.

TYPES OF STABILIZATION

- Mechanical Stabilization
- Soil Cement Stabilization
- Soil Lime Stabilization
- Flyash Stabilization
- Soil Bitumen Stabilization
- Stabilization by Geo-textiles
- …

Open for Projects!