Difference Between Flexible Pavement And Rigid Pavement

The road pavement is the layered structure located directly above the subgrade, and beneath the wearing surface which transmits the applied vehicle loads to the sub-grade and underlying soil.

Based on design considerations there are two types of pavements i.e. flexible pavement and rigid pavement. In this article, we will briefly discuss the difference between flexible pavement and rigid pavement.

Contents [show]

What Is Flexible Pavement?

Flexible pavement has very low flexural strength and is flexible in its structural action under vehicle loads. In this pavement, the wheel load stresses are transferred from grain to grain to the lower layers. The wheel load is distributed over a wider area, and the stress is also decreased with the depth.

Flexible pavements are constructed in many layers using bituminous materials like asphalt. The top layer is supposed to sustain maximum compressive stress whereas the lower layers will experience a lesser

magnitude of stress.

Types of flexible pavements:

- Conventional layered flexible pavement,
- Full – depth asphalt pavement,
- Contained rock asphalt mat (CRAM).

What Is Rigid Pavement?

Rigid pavements have a great amount of flexural strength or flexural rigidity. In this pavement, the load is distributed by the slab action, and the pavement acts as an elastic plate.

Rigid pavements are constructed by using Portland cement concrete (PCC). The pavement materials are placed either directly on the prepared sub-grade or on a single layer of granular or stabilized surface.

Types of rigid pavements:

- Jointed plain concrete pavement (JPCP),
- Jointed reinforced concrete pavement (JRCP),
- Continuous reinforced concrete pavement (CRCP), and
- Pre-stressed concrete pavement (PCP)

Difference Between Flexible Pavement And Rigid Pavement

Flexible Pavement	Rigid Pavement
Low initial cost.	High initial cost.
The wheel load is transferred by grain to grain mechanism.	The load is distributed by the slab action mechanism.
Have low flexural strength.	Have sufficient flexural Strength.
Less durable.	More durable.
Short service life, usually 15 years.	Long service life, more than 30 years.

Joints are not required.	Essentially require joints.
Have many layers of materials.	Have only one layer.
Require frequent repairing.	Do not require frequent repairing.
High repairing and maintenance costs.	Low repairing and maintenance costs.
Damaged by oil and chemicals.	No damage by oil and other chemicals like greece.
Design based on subgrade strength.	Design based on flexural strength.
Temperature variations do not produce stresses.	Temperature variations produce heavy stresses.
Deformation in the sub-grade is transferred to the upper layers.	Deformation in the sub-grade is transferred to the subsequence Layers
The thickness is more.	The thickness is less.
Constructed using bituminous materials like asphalt.	Constructed using portland cement.
Can be opened to traffic shortly after construction.	Require curing, which delays the opening to traffic.
Provides poor night visibility due to the color of asphalt.	Concrete offers good night visibility.
More resilient to vehicle loads.	Less resilient to vehicle loads.
Suitable for all types of traffic.	Noisy under iron-wheeled traffic.

Corrugations are developed.	No corrugations are developed.
Provides more tractive resistance.	Less tractive resistance than flexible pavement.
Easy to lay, locate or repair underground pipes below flexible pavements.	Difficult to repair underground pipes below rigid pavements.
No glare due to sunlight.	Glare due to reflected sunlight.
Stage development is practicable.	Stage development is not practicable.
Require good subgrade.	Good subgrade is not necessary.
Normal skill and less supervision are required.	Skilled workers are required.

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