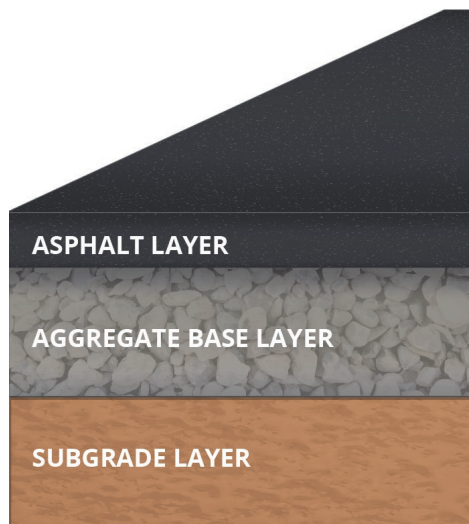


Asphalt 101



FROM MIX DESIGN TO FULL RECONSTRUCTION, BITUMINOUS ROADWAYS KNOWS ASPHALT



DESIGN

- Pavement is made up of an asphalt layer, an aggregate base layer and a subgrade layer.
- The thickness of each layer is critical when considering how to build a strong and long-lasting asphalt pavement.
- Before determining the thickness of each layer, consider the type of vehicles traveling over the pavement.

TRAFFIC LOADING

- Consider the type and frequency of vehicles using the pavement.
- Light duty traffic loading is mostly cars with a few large trucks.
- Medium duty traffic loading consists of some large trucks, i.e. a loading dock area.
- Heavy duty traffic loading is frequented by large, heavy trucks, i.e. a distribution center.

SUBGRADE

- Subgrade is the most important layer of asphalt pavement design.
- The strength of a subgrade can be measured from the type of material found underground using a tool called a DCP.
- Soft subgrades are mostly made of clay where a firm subgrade is made up of silty sands.
- The firmer the subgrade the less aggregate and asphalt mix will be needed to ensure a stable product.

Traffic + Subgrade = Design Thickness

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ASPHALT LIFE CYCLE

A pavement's lifecycle begins when it is first constructed. Over time, sun, water and traffic loading slowly deteriorates the pavement. Annual maintenance can extend the life of the pavement, but at some point, there is a time when routine maintenance would be ineffective. Pavement rehabilitation plays an integral role in a pavement's life cycle.

 **Green Bar:** As the color gets darker, the project cost increases because techniques are more involved.

 **Orange Bar:** As the color gets darker, the pavement life cycle extends, depending on technique.

ASPHALT PAVEMENT OVERLAY

If the pavement is still performing well, then an asphalt pavement overlay will refresh the pavement's surface and curb appeal. An asphalt overlay usually adds 1.5 to 2.5 inches of new asphalt pavement to the existing pavement.

1



2

MILL AND OVERLAY

If there are drainage issues, then a mill and overlay would be recommended. This rehabilitation method uses a milling machine to remove two or more inches of the existing pavement surface so a new layer of asphalt can be installed.

3

REMOVE AND REPLACE

If there is a strong aggregate base layer with a severely cracked or deteriorated asphalt surface, then a remove and replace technique would be best. This method removes the existing asphalt down to the aggregate base and replaces the old asphalt with a new pavement layer.

4

FULL DEPTH RECLAMATION (FDR)

If a pavement has excessive fatigue cracking and potholes, with a moderately decent subgrade, then a full depth reclaim would be a good rehabilitation choice. This technique uses a special machine to pulverize and blend the existing asphalt pavement with the aggregate base and subgrade soils to create a new, stronger base material. Full depth reclamation is a sustainable choice, as it recycles the pavement and reduces the amount of trucking required.

5

STABILIZED FULL DEPTH RECLAMATION (SFDR)

If a site has a poor subgrade or drainage issues below the pavement, then adding stabilization to a full depth reclamation is recommended. This process is similar to full depth reclamation, but cement or asphalt emulsion is introduced into the blend to create a stronger base material.

6

FULL RECONSTRUCTION

If pavements are under designed and at the end of their life-cycle, then a full reconstruction is the only option. Full reconstruction is the excavation of all asphalt pavement, aggregate base and subgrade soils to a depth that is equal to, or greater than, the thickness of the new pavement being constructed.



Reclaimer