



Concrete Overlays

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One of the major challenges for DOTs, counties, municipalities, airports and parking lot owners is extending the lifespan of pavements. The costs of continuous maintenance and repair of deteriorating pavements can be crippling. A full tear out and replace of concrete or asphalt pavements is very costly and can be highly disruptive to traffic or business operations. One way to mitigate both of these factors, while extending the life of a pavement, is through a concrete overlay.

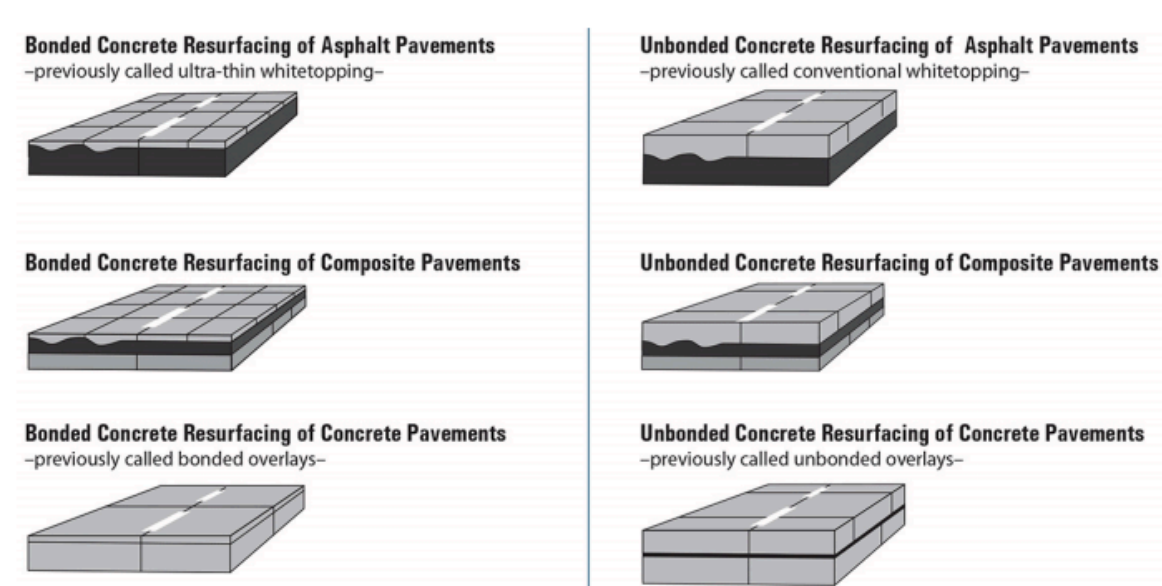
Overlays are accomplished by pouring new concrete over the top of existing concrete or asphalt pavement. Depending on the type of overlay and the condition of the existing pavement, this can sometimes be done for a fraction of the cost of full tear out and be completed in a fraction of the time.

Types of Overlays

Concrete overlays generally fall into two categories: Bonded and Unbonded.

Bonded overlays are used to increase the structural capacity of an existing pavement or give a new wearing course. In either case, the existing pavement must be structurally sound, and the additional thickness from the bonded concrete layer acts as one monolithic slab. The surface of the existing pavement is typically roughened, cleaned, and sometimes a bonding agent may be applied to assure proper bond to the new overlay. Bonded overlays are thinner, generally around 2-6 inches thick. A bonded overlay may be appropriate for existing pavements with low to medium distress. Some patching of potholes, alligator cracking, or rutting may be necessary before overlaying.

Unbonded overlays essentially turn the existing pavement into a base material, with a completely new pavement constructed on top of it. This type of application is suitable for pavements with low to moderate-high levels of distress where the pavement structure has not failed. A bond-breaker is necessary to prevent reflective cracking when overlaying concrete. Some areas of the worst distress may need to be patched or filled to create a consistent base. An unbonded overlay may be 4 inches thick for automobile traffic with a few trucks per day to 10 inches thick or more for heavy truck traffic. Unbonded overlays less than 6 inches thick may benefit from having macrosynthetic fibers added to the concrete mix.



Advantages of Concrete Overlays

Particularly if one is upgrading from an asphalt pavement to a concrete pavement via an overlay, the major benefit is extended life and durability of the pavement. A bonded concrete overlay can preserve a pavement for an extra 15-20 years and an unbonded overlay could last 20-30 years. As discussed in [Tech Bulletin #38](#), concrete enjoys advantages over asphalt in terms of life, durability, maintenance, safety, and customization.

Utilizing the existing pavement in the overlay design is a significant sustainability coup, due to reducing waste and preserving in-place materials. There are significant LEED credits available for concrete overlays.

Overlays can often be done much more quickly than a full tear out and replace, minimizing the construction impact. Perhaps most importantly, a concrete overlay can cost 30-50% less than a remove and replace parking lot.

What kind of pavements can be overlaid?

Concrete overlays be can performed on streets, highways, parking lots, driveways, runways, taxiways, bridge decks, or just about any kind of asphalt or concrete flatwork surfaces.





What kind of considerations should I be aware of before proceeding with a concrete overlay?

It is important to have an engineer assess the structural condition of the existing pavement. They can help identify if a bonded or unbonded overlay would be necessary, or even appropriate. They can identify the surface condition of the pavement and areas that require patching. They will consider the use case and traffic load for the final pavement. One important consideration, particularly on parking lots, is the impact to elevation and drainage of an overlay. If an overlay make the pavement too high to effectively use gutters or tie-ins, then an overlay might not be the right choice, or the scope of the project might increase.

Conclusion

Concrete overlays provide a durable, sustainable, and cost-effective solution for pavement rehabilitation. When properly selected and constructed, they deliver decades of additional service life at a fraction of the cost of reconstruction.

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