

The source for
pavement
rehabilitation
information

Pavement Principles

Lompoc USD's maintenance plan extends pavement life

As part of its overall cost-savings goals, Lompoc Unified School District wanted a comprehensive pavement maintenance plan for its 18 schools and district facilities. Among the District's concerns was pavement deterioration and how to slow the aging process. They asked Pavement Engineering, Inc. to evaluate its parking lots, walkways and playgrounds and develop a five-year plan to help them maximize pavement life and minimize expenses.

To meet the District's budget and risk reduction requirements, PEI developed a comprehensive course of action and a line-item budget for each of the District's 18 schools that allows the District to manage its capital outlay effectively while ensuring all safety requirements are met.

Each site-specific action plan included year-by-year recommendations and a budgetary cost per project.

Lompoc achieved its goal, according to Joe Ririe of PEI's San Luis Obispo office. "The plan is easy to follow and use and takes the guesswork out of managing pavement maintenance," he said.

For information on developing a five-year maintenance plan for your district, contact PEI at 877-883-4578.



Part one of a three-part series

Protecting your pavement investment

When it comes to maintaining your district's parking lots, playgrounds and walkways, it's important to save money. After all, it's a huge capital expense. But saving money is not just about securing the lowest bid for paving over the defects; it's about understanding the processes that cause deterioration and designing a maintenance program that will protect and extend the lifespan of pavement surfaces, potentially saving thousands of dollars over the typical lifespan of these surfaces.

Usually, asphalt concrete is the dominant pavement surface in any school district. Unfortunately, many contractors are not trained nor equipped to evaluate conditions that affect the pavement structure itself, conditions like the quality of the original structure, the native soil beneath it, traffic loads and drainage.

Pavement deterioration

Pavement deteriorates in two ways: fatigue and aging. These processes occur simultaneously.

Fatigue results from heavy wheel loads. School buses and garbage trucks place enormous stresses on pavement. Although asphalt concrete is somewhat flexible, over time and with repetitive traffic, it loses some its

flexibility, causing cracking on the lowest layer. Eventually, this cracking progresses upward until it reaches the surface.

Aging results from environmental influences. Asphalt concrete is composed of aggregates mixed with a binder. As the binder ages, its volatile components evaporate and it loses volume, and as the volume decreases, cracking occurs. Water and effects of the sun oxidize the binder, causing asphalt brittleness.

Common wear signs

The four most common pavement defects are raveling or weathering, longitudinal or transverse cracking, block cracking and alligator cracking (see examples on page 2). Any of these wear signs can result in water incursion, the enemy of any pavement structure. Water accelerates deterioration and dramatically shortens a pavement's lifespan.

Weathering or raveling can be the first sign of pavement deterioration. As the binder oxidizes, a pavement's fine aggregate components begin to wash away, revealing coarser aggregates. Eventually, the asphalt becomes rough and uneven.

Continued

Protecting your pavement investment

Continued

Longitudinal or transverse cracking runs parallel or perpendicular to the pavement's centerline. It results from environmental influences such as temperature and settlement or movement of the underlying layers and manifests itself in weak areas of the pavement such as paving joints.

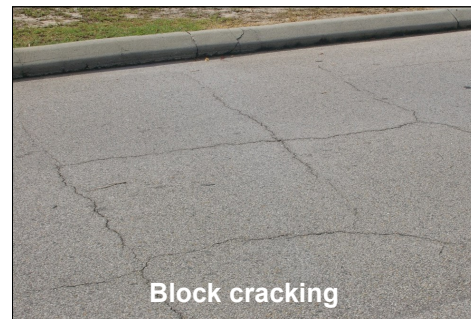
Block cracking, which is a combination of longitudinal and transverse cracking, has a distinctive checker-board pattern. Generally, it results as the binding agent evaporates and asphalt hardens and shrinks.

Alligator cracking is a series of inter-connecting cracks in the surface of asphalt pavement that looks like an alligator's hide. It may begin with a longitudinal crack under a wheel path, but repeated traffic loads cause the breakup of the surface layer. These cracks start on the bottom and work upward to the pavement's top surface. Alligator cracking is a clear sign of structural failure.

Knowing what causes each defect provides a better understanding of



Weathering or raveling



Block cracking



Alligator cracking



Longitudinal cracking

Four common signs of pavement wear are clockwise from top left: raveling or weathering, block cracking, longitudinal cracking and alligator cracking. Knowing what causes each defect provides a better understanding of what maintenance or rehabilitation treatment is needed. Applying the right treatment at the right time will extend pavement life and pro-

what maintenance or rehabilitation treatment is needed. Applying the right treatment at the right time will extend pavement life.

Choosing to delay or defer pavement maintenance may seem like a budgetary necessity, but ignoring even

small maintenance procedures only accelerates the deterioration cycle, which accelerates and inflates the capital expense down the road.

Next: Pavement preservation strategies followed by pavement preservation timing.

Tip of the month

Overspray from sprinkler systems is not just water wasteful, it is pavement's biggest enemy. Water oxidizes the binder that holds the asphalt and aggregate mix together, accelerating the aging process. If you notice weathering and raveling in specific pavement areas, check for possible leaks in your irrigating and watering system or adjust sprinkler heads to ensure water does not reach any paved area.

Have a question? Let us know and we will try to answer it in an upcoming issue.



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Paving your way to success

Pavement Engineering, Inc. is California's premier pavement engineering and rehabilitation expert, specializing in evaluating, designing, implementing and maintaining asphalt and concrete surfaces for public and private entities.

We provide the technical expertise to maintain roadways and parking lots cost-effectively, the managerial experience to make sure things run smoothly from inception to completion, and the proven track record that builds trust and loyalty.

Our number one goal is client satisfaction. We manage every dollar our clients spend as if it were our own – with common sense.