ASPHALT VS. CONCRETE

From A Contractor's Standpoint

Cost • Durability • Longevity • Versatility

When considering a job, a large part of any project isn't just the structure itself, but the surface that surrounds it. This is especially true for commercial construction. Pavement and parking areas comprise a large percentage of square footage on most commercial projects, with requirements for adequate parking spaces – whether in a traditional parking lot or a multiple-vehicle deck structure – for the number of workers, visitors or customers at a facility. Parking decks are generally always cast-in-place concrete structures, but often owners are faced with a choice when considering an expansive parking lot – concrete or asphalt?

Lee Ingram, owner of Ingram Construction, LLC, a Montgomery, Ala., based construction services firm, says there are a number of factors to consider when making this choice. Ingram Construction handles projects large and small, from fast-tracked industrial projects to multi-tenant retail centers, historical renovations and unusual small and specialty projects. Ingram founded the firm in 2007, after working with International Caddell Construction and then another local contractor after graduating from Auburn in 2007. Collectively, the team at Ingram brings more than 95 years of construction experience.

"We handle commercial and industrial projects from medical office buildings to large manufacturing and industrial facilities, and everything in between," Ingram says. "Recently, we were in Cahaba, in the woods, pouring sidewalks that allow handicapped canoers access to and from the water. Then, we turn around and construct an 85,000-square-foot stamping facility for Korean manufacturer Saehausung in Andalusia. We pretty much do anything," he says with a chuckle.

Recently, Ingram Construction worked as a partner to build a new State Farm office building in East Montgomery, in cooperation with Landmark Construction, which features a concrete parking lot. When making the decision about materials, developers and project owners should take a broad view, Ingram says. Certainly, initial budget and timeline are important, but other crucial factors that should be weighed include the project location, daily activities, environment and even the ground it's built upon.

cost

Price is generally the first factor that a project owner takes into consideration on any job. It's important for a project to be affordable. Often, concrete may initially appear a bit more expensive than asphalt. This is largely due to the fact that the installation process for concrete is a bit more time- and labor-intensive than that of asphalt. But the hidden costs of asphalt maintenance will over time well outpace those of concrete, which is built to last.

"Concrete is more expensive up front, but asphalt is more expensive long term," Ingram says. This is because concrete requires more site work on the front end. Contractors adjust the subgrade, install a form and do a controlled pour to control the grade. They cut joints into large sections of concrete to allow for expansion and contraction with the elements and the soil. Often, concrete parking lots or other expansive concrete surfaces are poured in several sections. Asphalt, on the other hand, is laid when the material is very hot and laid down with a machine in ¾-inch or more layer, then rolled and compressed in place, more or less in one continuous process.

But, Ingram says, "Asphalt has to be maintained and sealed every 3-5 years but you never have to do anything with concrete. It takes a little more time to lay concrete parking lots than asphalt, but the cost savings over the length of the project is much better with concrete than asphalt, and more than makes up the difference."

In recent years, the cost gap is actually narrowing even further. While concrete may take more time to install, it is made from abundant, readily available ingredients: water, rocks and cement, which also is made from natural materials. Alternatively, asphalt is made with petroleum products. With the rise in oil prices, asphalt is not as affordable as it was in years past, and today rarely costs much less than concrete. Combined with its high maintenance costs, asphalt isn't as affordable as it might seem.

durability

Asphalt is a flexible pavement. It has a thin surface layer that is built over a base of gravel or stone. In contrast, concrete is a rigid substance. Because of concrete's rigidity and stiffness, it tends to distribute the load over a relatively wide area of subgrade, making it extremely strong and durable. This is especially beneficial for high-traffic areas that bear heavy traffic, such as loading dock areas where there is a lot of tractor trailer traffic.

"Asphalt is easily damaged by medium and heavy duty trucks, and concrete is not," Ingram says. "A project owner should look at what kind of traffic they're going to be getting."

At the recently completed Saehausung manufacturing facility in Andalusia, for example, the client specifically requested concrete for its loading dock areas because it would stand up better to the constant traffic of heavy tractor trailers, Ingram said.

BENEFITS

Stable Pricing

Concrete is a locally manufactured product made with local materials. Asphalt's petroleum-based composition results in wide price swings as oil prices around the world rise. Furthermore, less asphalt is being produced by refiners due to advancements in refining techniques allowing them to produce more profitable fuels, thus lowering asphalt supply.

Low Maintenance

Normal maintenance costs of asphalt pavements– sealing, re-striping, resurfacing and loss of business during maintenance operations - greatly exceed those needed for concrete.

Ease of Construction

Concrete parking areas may include an integral curb and gutter, saving time and reducing subcontract labor.

Reduce Urban Heat Island Effect

Concrete parking areas stay much cooler than dark asphalt pavements during the day thus helping to alleviate the urban heat island effect.

Lower Energy Cost

Comparative research by the Portland Cement Association demonstrated that concrete parking areas require fewer lighting elements than other surfaces and can yield energy savings up to 60 percent.

"Concrete was chosen for the driveways for the tractor trailers to travel on specifically because of the durability it offers," he says.

The type of soil present on a job site also factors into the choice between concrete and asphalt for durability. Concrete holds up better in soil that has a high PI (plasticity index) – high plasticity in the soil. Soil with a high PI – like Alabama clay – has more tendencies to shrink or expand when moisture levels change. When you have a lot of movement in the soil, concrete holds up better, where asphalt tends to crumble. This was the case on the State Farm building.

"We chose concrete on that parking lot because of the unstable soil conditions. We knew that would cause a lot of damage on asphalt, so we decided to use concrete, which is a stronger, more durable product," Ingram said. "The choice to use concrete probably involved a little higher cost up front, as a developer, but we knew that would be earned back in lower maintenance costs," he said. "Concrete is going to be strong enough to deal with the soil on that site, so the owners aren't going to be worrying about patching and resurfacing. It ends up being a lot less expensive."

Concrete also can be reinforced, often with steel, if additional strength is needed. Asphalt cannot.

longevity

Going hand-in-hand with durability is longevity. Because asphalt is manufactured from petroleum products, the sun breaks it down more readily than the concrete. As a result, there is a lot less maintenance on concrete than asphalt. It is a rare to see a concrete parking lot that needs any type of repair or "patching," while this is a common and regular occurrence with asphalt, Ingram says.

"I have even seen asphalt parking lots that are patched with concrete," he says.

In addition to fairly regular patching and spot maintenance, asphalt also requires total resurfacing periodically. This is an expense for the owner, as well as an inconvenience, as the job requires the entire surface to be scored, dug up and removed. This often means diverting parking and re-routing or blocking traffic access to the building.

Maintenance breaks down on average as follows:
Asphalt – maintenance required every 2-4 years; resurfacing every 8-14 years.
Concrete – minor maintenance in 12-16 years; no resurfacing for 30-50 years.

Over time, asphalt pavement can cost up to three times more than concrete. Choosing concrete equals lower ownership costs vs. asphalt for the long haul.

versatility

Another benefit of concrete over asphalt is its versatility. Unlike asphalt, concrete can be colored and stamped to create unique aesthetic effects. Patterns and colors can be used to complement a building or help blend into the environment. The wide variety of choices just isn't possible with asphalt. It can be painted, but that is only a surface change, and it won't last.

Ingram recently worked on a project to expand the Luverne United Methodist Church, which was originally constructed in the 1920s. The company matched existing styles and colors, and added concrete driveways. Materials were chosen to complement the existing structure, and to ensure it would last another century.

"That was definitely one of the most interesting projects I've ever worked on," Ingram said. "I had never matched anything that was 90 years old."

There also are a number of decorative concrete products that can be incorporated into a concrete parking lot or other surface, such as pavers, that add additional pattern, color and texture. These often have an additional environmental benefit in helping to divert rainwater.

Concrete already is better than asphalt at diverting water and creating efficient runoff, because it can be laid more smoothly and flatter than one can pour asphalt, helping to avoid creating areas where water can pond on the surface. Additionally, the harder and more durable parking surface of concrete helps to facilitate even runoff.

This efficiency is enhanced with the use of pervious pavers, which, in addition to adding visual interest, are specially constructed from a combination of aggregates and other materials that make them highly permeable. This reduces storm runoff by allowing some of the rainfall to be absorbed into the ground. This can be especially beneficial in areas that must meet strict drainage requirements due to environmental concerns, or where the site offers particular challenges for drainage and runoff.

Concrete pavement also is brighter, having natural reflective properties. This not only improves the appearance of concrete, it actually makes it more energy efficient. Businesses require less energy to illuminate a concrete parking lot, and the surface generates less heat, which reduces the energy requirements of the adjacent buildings, which can absorb heat from an asphalt surface. According to the American Concrete Pavement Association, up to 27 percent of light falling on a concrete surface will be reflected, compared to as little as 5 percent of light from dark-colored pavements.

"Concrete just looks better than asphalt," Ingram says.

■ Wendi Lewis