

PRIVATE MARKET APPLICATIONS



Parking lots are the gateway to which all employees, customers, and visitors view upon arrival. As a first impression, it's important to welcome pedestrians with a well-maintained, smooth parking lot. Asphalt parking lots are the superior material of choice for parking lots due to their speed of construction, sustainability, and cost. When designing an asphalt parking lot important considerations are: traffic, subgrade, and drainage.

TRAFFIC

Pavements are designed to carry many different types of vehicles in traffic, including automobiles, trucks, buses, construction equipment, and freight trucks, among other vehicle types and loads. Most pavement designs are based on the area's traffic. If a large commercial parking lot is expected to have little to no traffic, a low-cost thinner pavement design would be acceptable.

However, the majority of commercial parking lots need to accommodate heavy, slow-moving loads. Typically, a parking lot plan will divide two to three pavement sections identified as: Light Duty, Medium Duty, or Heavy Duty.

The heaviest traffic often occurs during the construction phase. Failure to account for heavy construction loadings can cause problems throughout the life of the pavement. During the pavement design process, it's imperative to consider the size and weight of the construction equipment being used, and the pavement structure should be designed for proper thicknesses to handle the construction traffic. Sometimes special truck lanes are required to expedite traffic to loading areas, garbage dumpsters, and equipment areas. Design thickness for these pavement areas should be increased accordingly with a corresponding asphalt mix. For instance, polymers or stone matrix may be necessary in asphalt.

SUBGRADE

Every successful pavement structure is highly dependent on the quality of foundation laid. Within a pavement structure, the foundation refers to the underlying soil and subgrade layers. The higher quality (or stronger) subgrade can endure greater stresses, meaning the pavement structure thickness can be reduced compared to that needed for a weaker subgrade.

The main three subgrade categories are Poor, Medium, and Good based on the soil plasticity, classification, and strength. Soil evaluation by a geotechnical engineer is recommended to determine:

- Particle Size Distribution
- Liquid Limit and Plasticity Index
- Soil Classification
- California Bearing Ratio

Once determined, the subgrade category can be selected to proceed with the design process.

DRAINAGE

Providing proper drainage is essential for a long-lasting asphalt pavement. Drainage must be considered for both

the surface and subsurface (groundwater). Drainage should be carefully designed and installed early in the construction process.

The drainage system is designed to route minor storms quickly and efficiently to the storm sewer or open channel drainage with minimal impact on traffic and surrounding areas. Proper drainage systems will remove water quickly from paved surfaces minimizing cracks, reducing water reaching the subgrade, reducing movement during freeze-thaw cycles, and prolonging the pavement. Important factors to consider for parking lot drainage are gutter flow, surface drainage, inlet capacity, and inlet locations. The design of these factors is dependent on storm size and rainfall frequency.

Subdrains may be placed to intercept water that may flow under a pavement. The water is routed into a ditch or a stormwater system. The design of a subdrain system is dependent on the site and its existing soil, landscape area layout, and drainage system outlet points. Using a drainable rock base layer will allow moisture to pass through the stone and be carried away by the subdrains. Make sure to





specify an aggregate gradation that allows drainage but with enough fine material to compact and carry the construction equipment.

FREE TOOL FOR ASPHALT PARKING LOTS

PAVEXpress (PAVEXPress.com) is a free, online tool based on AASHTO Guide for Design of Pavement Structures 1993 for flexible pavements and AASHTO Guide for Design of Pavement Structures 1998 Supplement for rigid pavements. PAVEXpress is used by engineers, architects, and local agencies who need a reliable way to quickly determine the necessary pavement thickness for a specific roadway or parking lot project. PAVEXpress was developed by industry experts, is supported by the Asphalt Pavement Alliance (APA), and has been adopted by public agencies to help assess, scope, and design pavements.

For guidance and assistance on projects, additional resources can be found at DriveAsphalt.org/Resources or you may also contact your State Asphalt Pavement Association <https://sapainc.org/members/>.

