

## **Permeable paving as an application input to reduce damage from heavy rainwater**

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### **Abstract:**

Egypt and many other countries in the Arab world are among the countries with little rain in general. But the large number of climate changes in the world have doubled the possibilities of heavy rains, which resulted in what looks like torrential rains during the winter season more than once in the past few years, so that they have become a threat that is expected to occur every year. On the other hand, there was no interest in benefiting from this wasted natural water, and therefore it is assumed that ways to confront it and also benefit from it should be developed.

One of the effective solutions is the use of permeable paving systems, in order to reduce the damages resulting from heavy rainwater and floods, especially after the spread and recurrence of this phenomenon in many countries of the Arab world. For these systems to be effective, porous asphalt must be designed to have sufficient structural capacity to accommodate projected vehicle loads, to manage rainwater flow into the subsoil, as well as wastewater drainage operations.

This paper describes the best practices used to design and build permeable paving systems, which are considered one of the best applications used worldwide now, with a focus on the lessons learned from construction, whether on narrow roads, expressways, sidewalks, and parking lots, in addition to studying the engineering characteristics of each type, Structural characteristics and durability, as well as reviewing all the environmental benefits resulting from this, especially the material aspect that some consider the main factor, which may prevent this from being achieved. There is no doubt that these environmental methods are one of the most effective means to meet the increasing environmental demands, which results in the capture of torrential rainwater, allowing it to seep through a group of treated layers to the lower layers of the earth, or to the drainage channels connected to it, and then the use of the land becomes more Efficient, and with less damage.

### **Keywords:**

Permeable Pavement, Porous Asphalt, Pervious Concrete, Heavy rain.