FEBRUARY 2008 MEETING

Wednesday, February 13, 2008

TECHNICAL PROGRAM

Asphalt Pavements - Perpetual to Porus

Speaker: Gary Fitts, P.E. with Asphalt Institute, San Antonio, TX., Tel: (210) 590-9644

PRESENTATION SUMMARY

To a room of about 60, Gary Fitts, a licensed professional engineer and Senior Field Engineer for the Asphalt Institute in San Antonio TX, gave a presentation entitled, "*Asphalt Pavements-Perpetual to Porous*". According to Mr. Fitts, asphalt pavements are the most widely used type of pavement around the world for all types of traffic and subgrade conditions. With his slide presentation Mr. Fitts discussed a) the concept of long-life, or "perpetual" asphalt pavements with long design lives, and b) "porous" asphalt pavements that are now being considered as a means to minimize the need for detention basins to store runoff from parking lots and other new developments.

Asphalt pavements are commonly designed for 40 years in France and Germany, much longer than in the US. The key to designing a long-life or "perpetual" pavement is a mechanistic empirical design. Mr. Fitts described fatigue testing done on beam coupons cut from Hot Mix Asphalt (HMA) samples. The goal is to design and construct a mix with less than 100 micro-strains, which gives an infinite fatigue life. The stiffness of the base and subbase is also important. Intelligent compaction is useful in the construction to ensure the correct stiffness of each layer is attained in the field.

Mr. Fitts said many sections of perpetual pavements are being used on I-35, which has had a large increase in truck traffic because of NAFTA. He directed the engineers to free software, PerRoad 3.2, which utilizes a Monte Carlo simulation to analyze the inputted combined layer stiffnesses of the proposed design and compute the system fatigue life. He said a safety factor of 10 is then applied on the computed fatigue life in order to compute the desired design life.

To download a free copy of PerRoad 3.2, click here.

Porous pavements are on the other end of the spectrum according to Mr. Fitts. Instead of high stiffness and compaction, the idea is to achieve a weak, poorly-compacted pavement with sufficient voids to allow storm water to percolate to a recharge bed below the surface. While porous asphalt designs cannot be used for highways, they can be used for parking lots with light vehicles in areas where it is imperative to detain storm water on new developments.

Mr. Fitts was not aware whether the Harris County Flood Control District was currently awarding any detention credits for this design type. The recharge bed below the pavement is essentially a buried detention pond, say 4 ft. deep, with French drains removing the stormwater at the bottom. The pavement surface is intentionally constructed flat and drains quickly, though an overflow system may be needed for torrential downpours. The design life for this application can be as much as 20 years. Porous pavement was first used in The Woodlands TX in the 1970's and has gained more recognition since the 1990's.

To download Mr. Fitt's slide presentation, click here.