

# top10 list



## WAYS TO GET MORE DURABLE HMA PAVEMENTS

**#1** DO  
YOUR  
HOMEWORK

Roads are a major asset that play a significant role in the social and economical development of any community. Therefore, proper pavement design along with timely maintenance and rehabilitation are essential to ensure their durability and long-term service. Producing an adequate pavement structure that supports future traffic loads is highly dependent on proper pavement design, and selection of the right mix and performance graded asphalt cement (PGAC). Doing your homework first, to satisfy these requirements, guarantees good return on pavement infrastructure investment.

The following checklist serves as a reminder to engineers and decision makers for achieving more durable asphalt pavements.



## PAVEMENT DESIGN

- Pavement design is far more complex than most people realize. Roads have to withstand a combination of loads and stresses that depend not just on the type of traffic, but also the geometry of the road, the climactic conditions under which it operates and the geology of the ground upon which it rests. The OAPC's **ABC's of Pavement Design** introduces various concepts and cost-effective design solutions/methods for asphalt pavements and overlays.



## PAVEMENT GEOMETRICS

- The geometrics of the pavement is a crucial consideration for any roadway system. This is important to ensure proper design of traffic capacities, safety and comfort requirements. Adequate clearances for roadway structures, shoulder and grading width(s) for design traffic, curb and gutter considerations for establishing cross sections and constructability requirements are key checklist items to note. Paying attention to constructability needs ensures that the correct procedures for determining required elevations and stiffness of the exiting subgrade soil are pursued.



## PAVEMENT CONDITION INVESTIGATIONS

- Pavement condition is quantified through different condition rating systems that take into account functional and structural conditions. Making the right decisions on the appropriate rehabilitation/maintenance strategies significantly relies on the monitoring and evaluation of existing conditions. Such evaluations provide accurate design parameters that are critical for producing reliable design outputs that further contribute to the desirable pavement performance throughout its design service life. Additional key aspects of pavement condition investigations include:

### - DISTRESS SURVEYS

- + A good understanding of the types of distress present in the pavement, and the causes for those distresses is essential to the success of pavement rehabilitation. Ontario uses two interrelated measures - riding quality and distress manifestations as the basis for condition ratings. The distress data obtained is evaluated for distress manifestation in general accordance with the applicable MTO, LTPP manuals and/or ASTM test methods.



### - STRUCTURAL ADEQUACY EVALUATIONS

- + Determining underlying drainage and material components and identifying sub-surface discontinuities through non-destructive test methods such as Falling Weight Deflectometer (FWD) and Ground Penetrating Radar (GPR) are highly desirable especially when the distress survey indicates that the pavement requires a structural improvement.
- + It is essential to pair FWD and GPR investigations with other geotechnical investigation techniques such as analysis of core and borehole samples. These techniques are vital in determining the underlying material components of a pavement section as well as identifying any subsurface and drainage issues that help in selecting the appropriate rehabilitation approach.



## USE OF PERFORMANCE GRADED ASPHALT CEMENT (PGAC)

- Asphalt cement contributes up to one third of a pavement's rutting resistance, over half of the fatigue crack resistance and almost 90% of low temperature cracking performance. Specifying the right asphalt cement is essential. A good understanding of the integration between selection and specification of PGAC, volumetric mix design system and mix performance prediction system is essential to improve the performance and durability of asphalt pavements. The OAPC's **ABCs of PGACs** (1999) brochure, provides guidance and key information on how to select, order and test PGACs and how to use them with Superpave design methods. Additional updates detailing lessons learned and latest changes to Ontario's PGAC procedures are provided in the OAPC's **ABCs of PGACs** (2017) brochure.



## PAVEMENT MANAGEMENT SYSTEMS (PMS)

- The goal of extending pavement life is best achieved by applying the most appropriate maintenance and rehabilitation treatment while the pavement is still in relatively good condition and has no structural damage. An important part of doing your homework requires road owners to integrate pavement maintenance and rehabilitation into their Pavement Management System (PMS). This strategy is not only proactive, but greatly assists the objectives of maintaining the condition of the pavement network within budget constraints.



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