

VI INTERNATIONAL CONGRESS Valorization and Recycling of Industrial Waste



- PERFORMANCE-RELATED SPECIFICATIONS FOR RAP MIXTURES
- CHARACTERIZATION AND QUALITY CONTROL OF BY-PRODUCTS

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Performance-Related Specifications (for RAP Mixes





- 1. RAP influences both the high- and low- temperature properties of the asphalt binders and the asphalt mixtures (NCHRP studies)
- The properties of the mixtures containing RAP are mainly influenced by:
 - Aged RAP binder properties
 - Amount of RAP in the mixture
- 3. The structural performance of recycled mixtures is equal and in some instances better than that of conventional mixtures (Little, Brown, Meyers, Kandhal).
- The mixtures containing RAP age at a slower rate than the virgin mixture (Kiggundu et al.)

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Performance-Related Specifications for RAP Mixes



INDIRECT TENSILE STRENGTH:

Higher tensile strength values for the mixtures containing RAP (Kennedy and Perez);

RESILIENT MODULUS:

The addition of RAP increases the stiffness of the mixtures (Sondag et al.);

COMPLEX MODULUS:

Addition of RAP to a mixture increases the complex modulus (Marasteanu);

MIXTURE DURABILITY (moisture susceptibility):

Tensile strength ratio: inclusion of coarse RAP decreases the moisture susceptibility (Stroup-Gardiner);

Marshall stability: RAP does not improve moisture sensitivity of the mixes (Brownie and Hironaka);

HEATING SUCEPTIBILITY:

Weight Loss after a thermal shock: not significant (Montepara);

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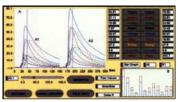
Characterization and Quality-Control of By-Products







- PREVENT LOW QUALITY MATERIAL
- PERFORM ANALYSIS "AD HOC" (according to the specific recycling material)





1.SUGAR REFINERIE WASTES



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NEED FOR:

- DEFINING "PERFORMANCE-BASED" SPECIFICATION
- DEFINING A SAMPLING PROTOCOL
- COMPACTION AND CONSTRUCTION SPECIFICATIONS
- QUALITY CONTROL PROTOCOL

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