TOPOVIAL

- Creado en julio de 2008.
- Director: Hugo Alexander Rondón Quintana, Ph. D.
- Clasificación ante Minciencias: Institucionalizado.
- Líneas de investigación:

  - ✓ Topografía.
  - ✓ Tránsito.
  - ✓ Diseño geométrico de vías.
  - ✓ Infraestructura sustentable.
  - ✓ Materiales para carreteras.
  - ✓ Asfaltos modificados.

- Integrantes activos:

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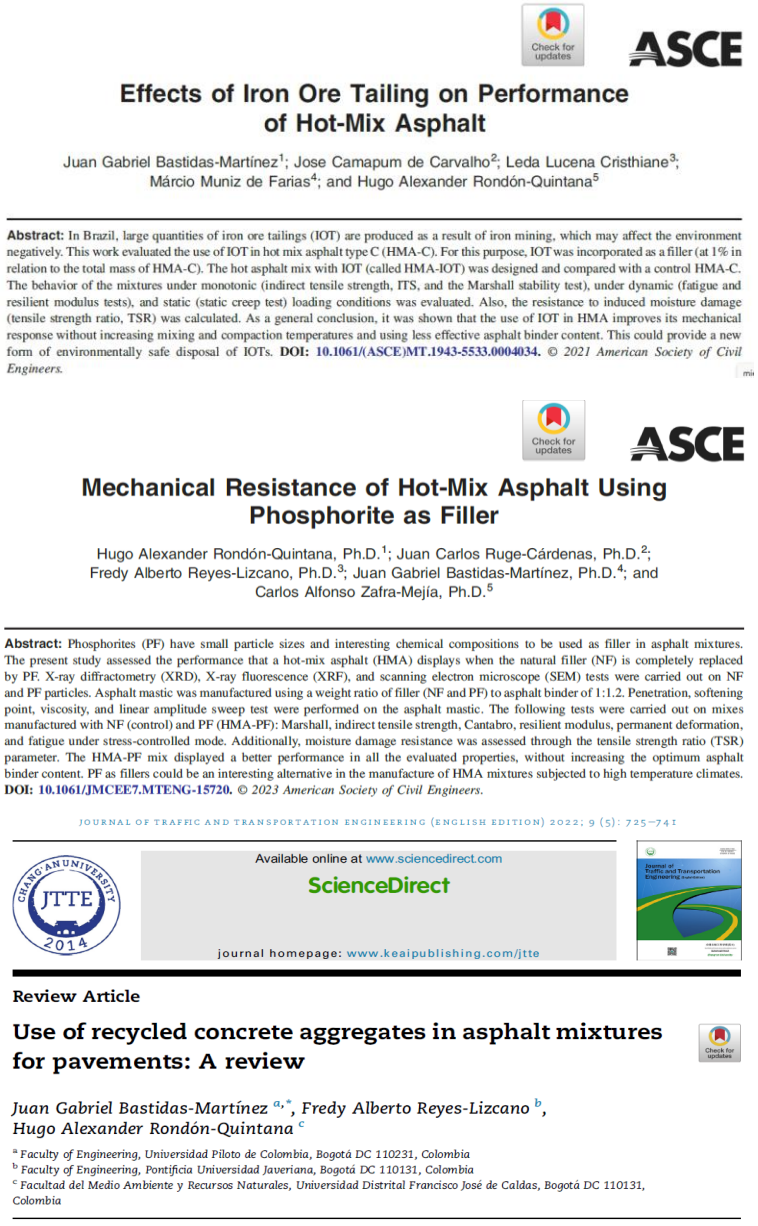
  - ✓ Mario Arturo Rincón Villalba, M. Sc.
  - ✓ Estudiantes de Pregrado, Maestría y Doctorado.



Effects of Iron Ore Tailing on Performance of Hot-Mix Asphalt

Juan Gabriel Bastidas-Martínez[1]; Jose Camapum de Carvalho[2]; Leda Lucena Cristhiane[3]; Márcio Muniz de Farias[4]; and Hugo Alexander Rondón-Quintana[5]

Abstract: In Brazil, large quantities of iron ore tailings (IOT) are produced as a result of iron mining, which may affect the environment negatively. This work evaluated the use of IOT in hot mix asphalt type C (HMA-C). For this purpose, IOT was incorporated as a filler (at 1% in relation to the total mass of HMA-C). The hot asphalt mix with IOT (called HMA-IOT) was designed and compared with a control HMA-C. The behavior of the mixtures under monotonic (indirect tensile strength, ITS, and the Marshall stability test), under dynamic (fatigue and resilient modulus tests), and static (static creep test) loading conditions was evaluated. Also, the resistance to induced moisture damage (tensile strength ratio, TSR) was calculated. As a general conclusion, it was shown that the use of IOT in HMA improves its mechanical response without increasing mixing and compaction temperatures and using less effective asphalt binder content. This could provide a new form of environmentally safe disposal of IOTs. **DOI: 10.1061/(ASCE)MT.1943-5533.0004034.** © *2021 American Society of Civil Engineers.*

Mechanical Resistance of Hot-Mix Asphalt Using Phosphorite as Filler

Hugo Alexander Rondón-Quintana, Ph.D.[1]; Juan Carlos Ruge-Cárdenas, Ph.D.[2]; Fredy Alberto Reyes-Lizcano, Ph.D.[3]; Juan Gabriel Bastidas-Martínez, Ph.D.[4]; and Carlos Alfonso Zafra-Mejía, Ph.D.[5]

Abstract: Phosphorites (PF) have small particle sizes and interesting chemical compositions to be used as filler in asphalt mixtures. The present study assessed the performance that a hot-mix asphalt (HMA) displays when the natural filler (NF) is completely replaced by PF. X-ray diffractometry (XRD), X-ray fluorescence (XRF), and scanning electron microscope (SEM) tests were carried out on NF and PF particles. Asphalt mastic was manufactured using a weight ratio of filler (NF and PF) to asphalt binder of 1:1.2. Penetration, softening point, viscosity, and linear amplitude sweep test were performed on the asphalt mastic. The following tests were carried out on mixes manufactured with NF (control) and PF (HMA-PF): Marshall, indirect tensile strength, Cantabro, resilient modulus, permanent deformation, and fatigue under stress-controlled mode. Additionally, moisture damage resistance was assessed through the tensile strength ratio (TSR) parameter. The HMA-PF mix displayed a better performance in all the evaluated properties, without increasing the optimum asphalt binder content. PF as fillers could be an interesting alternative in the manufacture of HMA mixtures subjected to high temperature climates. **DOI: 10.1061/JMCEE7.MTENG-15720.** © *2023 American Society of Civil Engineers.*

JOURNAL OF TRAFFIC AND TRANSPORTATION ENGINEERING (ENGLISH EDITION) 2022; 9 (5): 725–741

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Review Article

Use of recycled concrete aggregates in asphalt mixtures for pavements: A review

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