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ISCP NEWS



ISCP NAMES GEOFF AYTON HONORARY MEMBER

ISCP website article:
<https://www.concretepavements.org/2015/07/30/iscp-names-geoff-ayton-honorary-member/>



11TH ICCP SPONSORSHIP OPPORTUNITIES NOW AVAILABLE FOR 2016

11th ICCP Brochure:
<https://www.concretepavements.org/2015/08/11/11th-iccp-sponsors-hip-opportunities-now-available/>

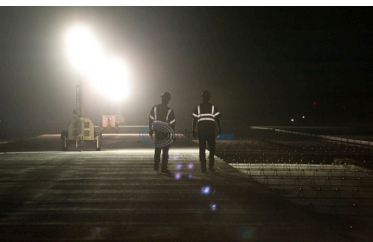
RESOURCES

National Concrete Pavement Technology Center



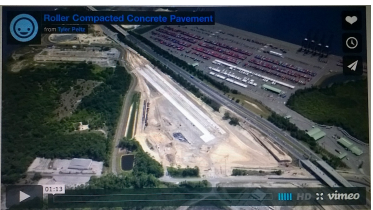
CP TECH CENTER HIRING AN ASSOCIATE DIRECTOR

ISCP website article:
<https://www.concretepavements.org/2015/08/12/cp-tech-center-is-hiring-an-associate-director/>



TEXAS CITY & FAA UPGRADING 70-YEAR-OLD CONCRETE LANDING STRIPS

ISCP website article:
<https://www.concretepavements.org/2015/08/04/texas-city-faa-upgrading-70-year-old-concrete-landing-strips/>



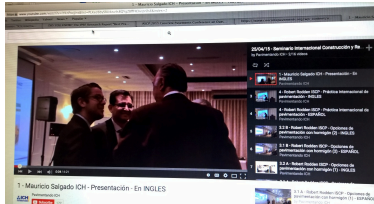
CAPTIVATING TIME LAPSE VIDEO: ROLLER COMPACTED CONCRETE PAVEMENT (RCC)

ISCP website article:
<https://www.concretepavements.org/2015/08/05/time-lapse-video-roller-compacted-concrete-pavement-rcc/>

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ISCP Members & friends are invited to submit items for website articles: newsletter@concretepavements.org



16 VIDEOS AVAILABLE OF THE DAY'S EVENTS: "ICH INTERNATIONAL ONE-DAY SEMINAR"

ISCP website article:
<https://www.concretepavements.org/2015/08/11/videos-available-ich-international-one-day-seminar/>



DRONE VIDEO ILLUSTRATES BEAUTIFUL, SAFE, CONCRETE ROUNDBOUTS IN WISCONSIN, USA

ISCP website article:
<https://www.concretepavements.org/2015/08/17/drone-video-illustrates-beautiful-safe-concrete-roundabouts-in-wisconsin-usa/>



NOW AVAILABLE: AGENDA WITH LINKS TO PRESENTATIONS & VIDEOS FROM THE JUNE 25TH ILLINOIS WORKSHOP

ISCP website article:
<https://www.concretepavements.org/2015/08/18/now-available-agenda-with-links-to-presentation-s-videos-for-the-june-25th-illinois-workshop/>

PUBLICATIONS



AUGUST 19TH IS NATIONAL AVIATION DAY! "SPIRIT OF ST. LOUIS AIRPORT CONCRETE OVERLAY"—CP ROAD MAP AUGUST BRIEF

ISCP website article:
<https://www.concretepavements.org/2015/08/19/august-19th-is-national-aviation-day-spirit-of-st-louis-airport-concrete-overlay-cp-road-map-august-brief/>

Tech Brief

MATERIALS-RELATED DISTRESS: HARDENED CEMENT PASTE Best Practices for Jointed Concrete Pavements

INTRODUCTION

Concrete is a cement-aggregate mixture where aggregates are bound together by a cementitious matrix, or hardened cement paste (HCP). Both the aggregates and HCP need to be considered when discussing concrete durability or materials-related distress (MRD).

The purpose of this tech brief is to provide pavement engineers with information to help them identify and choose materials that will last for the desired lifetime of the pavement. This tech brief focuses on considerations for the cementitious matrix in response to plastic-related distress mechanisms. Aggregate-related mechanisms are discussed in a separate parallel tech brief (Taylor and Wang 2015).

HARDENED CEMENT PASTE

There currently is no definition for hardened cement paste (HCP) within ASTM Committee C09 on Concrete and Concrete Aggregates or the American Concrete Institute (ACI). For the purposes of this tech brief, HCP is considered to include cement, supplementary cementitious materials (SCMs), water, hydrator products, any admixtures, and entrained air.

Hardened cement paste forms primarily from the hydration reactions between portland cement and water. Cellular calcium silicate hydrate (CSH) and calcium hydroxide (CH) are the primary products of the hydration reactions.

The CSH component provides strength and is desirable. The CH provides little strength and plays a role in most MRD mechanisms because CH is soluble in water and is highly susceptible to decreasing temperature. So exposure to water, particularly at low temperatures, results in CH leaching from the concrete thereby increasing the permeability and allowing increased water ingress.

In addition, CH is a component in some of the deleterious chemical reactions associated with MRD.

In general, pozzolans (e.g., fly ash, silica fume) are added to concrete mixtures to react with CH and form additional CSH, thereby consuming the undesirable component and decreasing the permeability of concrete. Entrained air is provided to protect the HCP from typical freeze-thaw (FT) damage.

Since the discovery of an entrainment, research has been conducted to understand how air voids provide the FT protection observed in practice. Although much has been discovered, the exact mechanisms are still not completely understood.

It is known that an air-void distribution is achieved where the voids are spaced near enough, and the concrete does not become critically saturated (i.e., ~85% of the available pore space that can be filled, the pores will be protected from CH leaching). To achieve the required air void spacing, typically an air content of 2 to 8% by volume of concrete is required (Mindess et al. 2003).

FHWA TECH BRIEF: "MATERIALS-RELATED DISTRESS: HARDENED CEMENT PASTE . . . BEST PRACTICES FOR JCP"

ISCP website article:
<https://www.concretepavements.org/2015/08/12/fhwa-tech-brief-materials-related-distress-hardened-cement-paste-best-practices-for-jcp/>

Southeast Transportation Consortium

Final Report 550

Best Practices for Achieving and Measuring
Pavement Smoothness, A Synthesis of State-of-Practice

by

David K. Morris

George A. Chouinard, Ph.D.

Jennifer L. Kuehling

The Transcore Group, Inc.



Published by:

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STC PUBLICATION: "BEST PRACTICES FOR ACHIEVING & MEASURING PAVEMENT SMOOTHNESS, A SYNTHESIS OF STATE-OF-PRACTICE"

ISCP website article:
<https://www.concretepavements.org/2015/08/11/stc-publication-best-practices-for-achieving-and-measuring-pavement-smoothness-a-synthesis-of-state-of-practice/>

Un Informe de Investigación de la IPRF Fundación de Investigaciones de Pavimentos Innovadores Programa de Tecnología de Pavimentos de Concreto para Aeropuertos

Informe IPRF-01-G-002-1

Mejores prácticas para la
construcción de pavimentos de
concreto de cemento Portland
(Pavimento rígido para
aeropuertos)



Oficina de Gestión de Programas
6710 Massachusetts Avenue, N.W.,
Suite 200
Washington, DC 20001

Abril de 2003

Documento ACPA N° JP07P

DID YOU KNOW? THE IPRF BEST PRACTICES FOR AIRPORT PORTLAND CEMENT CONCRETE PAVEMENT CONSTRUCTION IS NOW AVAILABLE IN SPANISH!

ISCP website article:
<https://www.concretepavements.org/2015/08/12/did-you-know-the-iprf-research-report-best-practices-for-airport-portland-cement-concrete-pavement-construction-is-now-available-in-spanish/>

Tech Brief

BLENDED AGGREGATES FOR CONCRETE MIXTURE OPTIMIZATION Best Practices for Jointed Concrete Pavements

INTRODUCTION

Historically, aggregate gradation has been controlled by specifications that call out envelopes for individual fractions. Typically, the coarse aggregate and the fine aggregate. The assumption of the approach is that the gradation of the overall system is not addressed. While it is desirable to specify coarse and fine aggregate, the assumption of what comprises a good combined gradation is the topic of this tech brief.

The combined grading of aggregate yields a concrete mixture that meets the minimum that must be achieved because the variability of the mix and the risk of segregation and potential of low durability behavior make due to the air void content. The assumption of the approach is that the gradation of the overall system is not addressed. While it is desirable to specify coarse and fine aggregate, the assumption of what comprises a good combined gradation is the topic of this tech brief.

Measures that have well-proportioned aggregates and are responsive to variations in the mix and the risk of segregation and potential of low durability behavior make due to the air void content. The assumption of the approach is that the gradation of the overall system is not addressed. While it is desirable to specify coarse and fine aggregate, the assumption of what comprises a good combined gradation is the topic of this tech brief.

Another significant benefit of designing a well-graded aggregate system is that the particles are more uniform in size during construction because less is required to compensate for poor workability, thus increasing the water-to-cementitious materials ratio (w/c) and compensating potential durability and strength.

Concrete mixtures containing excess paste (i.e., more than is needed for placing and finishing) exhibit numerous undesirable characteristics, including the following:

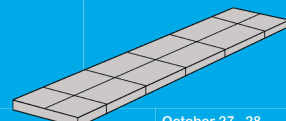
Figure 1: Blended aggregate system for an optimized surface (in hand finishing required)

FHWA TECH BRIEF: "BLENDED AGGREGATES FOR CONCRETE MIXTURE OPTIMIZATION" . . . BEST PRACTICES FOR JCP VIDEO ON ISCP WEBSITE

ISCP website article:
<https://www.concretepavements.org/2015/08/04/new-fhwa-tech-brief-blended-aggregates-for-concrete-mixture-optimization-best-practices-for-jcp/>

CONFERENCES & WORKSHOPS

ALL about JOINT DESIGN and CONSTRUCTION



October 27 - 28
ACPA Headquarters
Rosemont, Illinois

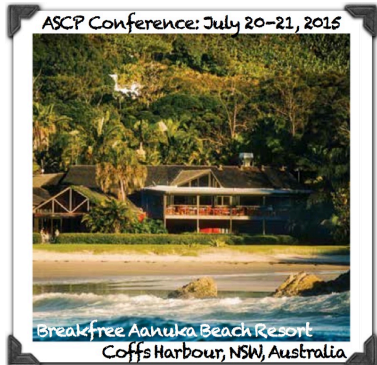
ACPA WORKSHOP TO BE HELD IN OCTOBER "ALL ABOUT JOINT DESIGN & CONSTRUCTION"

ISCP website article:
<https://www.concretepavements.org/2015/07/29/acpa-workshop-to-be-held-in-october-all-about-joint-design-construction/>

MAINTENANCE OF TRAFFIC WORKSHOP

ACPA'S JUNE MID-YEAR MEETING HELD CONCRETE PAVING WORKSHOP & 3 TASK FORCE MEETINGS

ISCP website article:
<https://www.concretepavements.org/2015/07/29/concrete-paving-workshop-task-force-meetings-included-in-acpas-june-mid-year-meeting/>



ASCP'S "2015 CONCRETE PAVEMENT CONFERENCE" AN OUTSTANDING SUCCESS!

ISCP website article:
<https://www.concretepavements.org/2015/08/12/ascp-2015-concrete-pavements-conference-an-outstanding-success/>