ACI522
Research Subcommittee
Update 3/28/06

1: Please welcome Peter Yen: Bechtel National Inc. who writes: 'Although I have no current research to report, I performed research and prepared a technical grant report on a pumpable pervious grout for geotechnical applications…The background material I collected from a comprehensive literature search 10 years ago included pervious materials from civil construction and petroleum drilling technology.'

2: Current Conclusions of Iowa State Study. Performed by Vernon R. Schaefer, Keijin Wang, Muhannad T. Suleiman and John Kevern and sponsored by Iowa DOT. Final report (February 2006) can be found at: http://www.ctre.iastate.edu/reports/mix_design_pervious.pdf

- **Smaller aggregate produces higher strength**
- **River gravel generally produces higher strength than limestone**
- **• The use of sand increases strength while slightly decreasing void ratio and permeability**
  The use of fibers increases tensile strength and permeability without affecting other PCPC properties
- **Proper compaction is key to producing durable PCPC**
- **Sand is required to produce freeze-thaw durable PCPC using the ASTM C666A procedure**

Well designed pervious concrete can meet strength, permeability, and freeze thaw requirements for cold weather climates

3. University of South Carolina: Liv Haselbach et al. Current paper activity:

Valavala, S., Montes, F., Haselbach, L., 2006. *Area rated rational coefficient values for portland cement pervious concrete pavement*. American Society of Civil Engineers (ASCE) Journal of Hydrologic Engineering, Vol. 11, Issue 3

Haselbach, Valavala, Montes (2006) *Permeability Predictions for Sand Clogged Portland Cement Pervious Concrete Pavement Systems*, accepted Elsevier Journal of Environmental Management

Montes, F. and L.M. Haselbach (2006) *Measuring Hydraulic Conductivity in Pervious Concrete:* accepted Environmental Engineering Science

Strength Measurements of Field-Placed Pervious Concrete L. Haselbach, C. Pierce, K. Pulis, F. Montes, and S. Valavala , Resubmitted early 2006 with revisions to ACI Materials Journal.

Haselbach, Liv M. and Robert M. Freeman, Vertical Porosity Distributions in Pervious Concrete Pavement: submitted to American Concrete Institute (ACI) Materials Journal 7/29/05

Haselbach, L.M., and Freeman, R.M., Effectively Estimating In-situ Porosity of Pervious Concrete from Cores, submitted to the Journal of ASTM International, December 2005

4: Don't forget the Pervious Conference in Nashville May 24-25, 2006.

5: The ACI meeting in Atlanta, April 22-26, 2007 will feature an entire session on pervious. Make sure you submit an abstract. Due by end of July 2006!!!!!!!!

6: Coventry University and The University of Wisconsin Milwaukee Centre for By-products Utilization (UWM-CBU) announce an international conference on **"Sustainable Construction Materials and Technologies" to be held at Coventry University, Coventry, UK on Monday 11 June 2007 to Wednesday 13 June 2007.** The conference is intended to highlight case studies and applied research that show new and innovative ways of achieving sustainability of construction materials and technologies. Papers are invited on all the different materials that are used in construction including cementitious materials (fly ash, wood ash, silica fume, slag, natural pozzolans, and others), aggregates, admixtures, concrete, timber, masonry, metals, plastics, glass, bitumen, lime, and gypsum. **Abstracts of 200 – 300 words should be submitted by email to: <p.claisse@coventry.ac.uk> by March 31, 2006.** The conference will be held at Coventry University. Full details are available from the conference website at: http://www.uwm.edu/dept/cbu/coventry.html

I submitted an abstract.

7: Please submit any updates to me on research that you would like listed here before each National Meeting or let me know if you want to be listed on our website. A listing of some other researchers can be found at: http://www.ce.sc.edu/AreasofStudy/Environmental/ResearchProjects/default.htm

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8: An update on pervious concrete research that has been happening at Clarkson / Purdue.

PCA has come out with the following 2 monographs on EPC (pervious concrete) based on our work. Many of the results in the Iowa state study that you had in your mail can be found in these reports too. They are available from PCA bookstore.

1.Neithalath, N., Weiss, W.J., and Olek, J., (2005). "Reducing the noise generated in concrete pavements through modification of the surface characteristics", PCA R&D Serial No. 2878, Portland Cement Association, Skokie, IL

2.Neithalath, N., (2005). "Development and characterization of acoustically efficient cementitious materials", PCA R&D Serial No. 2924, Portland Cement Association, Skokie, IL

Another detailed document that is available for public on mixture proportions, characterization, and properties of pervious concrete at the National Transportation Libraries website: "Development of quiet and durable portland cement concrete paving materials" and the link is:
http://ntl.bts.gov/card_view.cfm?docid=24636

The concrete Producer magazine has an article titled "Silencing Concrete" in its Nov 2005 issue based on our work. "Silencing Concrete" (2005). Article on research in enhanced porosity concrete, reported by The Concrete Producer magazine in the section "What's New", November 2005

The following paper / presentation is going to be included in the proceedings of the Nashville NRMCA Concrete Tech forum: Neithalath, N., Weiss, W.J., and Olek, J., (2006). "Predicting the permeability of pervious concrete from non-destructive electrical measurements", proceedings of the 2006 Concrete Technology Forum on Pervious Concrete, Nashville, May 2006

The following papers have been published / accepted for publication..

1.Neithalath, N., Weiss, J., and Olek, J., (2006). "Characterizing Enhanced Porosity Concrete using electrical impedance to predict acoustic and hydraulic performance", Cement and Concrete Research (accepted for publication)

2.Neithalath, N., Garcia, R., Weiss, J., and Olek, J., (2005). "Tire-Pavement Interaction Noise: Recent research on concrete pavement surface type and texture", International Journal of Concrete Pavements, Vol.1, No.1, December 2005, pp. 88-105

For the paper and presentation titled "Tire-Pavement Interaction Noise: Recent research on concrete pavement surface type and texture", which enumerates the characterisitcs and performance of EPC, we received the Bengt Friberg award for Best Paper by a Young author at the 8th International Conference on Concrete Pavements held at Colorado Springs, Aug 2005.

In addition, we have papers under review / preparation on the non-destructive determination of porosity of pervious concrete, influence of pore structure on transport of water and hydrocarbons through pervious concrete. Narayanan Neithalath

9. And from Bill Hunt at NC State: Two papers have been submitted to the Journal of Irrigation and Drainage Engineering:

A FIELD SURVEY OF PERMEABLE PAVEMENT SURFACE INFILTRATION RATES, (decision pending) and Evaluation of Four Permeable Pavement Sites in Eastern North Carolina for Runoff Reduction and Water Quality Impacts (under review)

The authors on each are: Bean, E.Z., W.F. Hunt, and D.A. Bidelspach.

A summary piece on our research can be found here: www.bae.ncsu.edu/stormwater (general link)
http://www.bae.ncsu.edu/stormwater/PublicationFiles/NWQEPnotes2005.pdf

Please note that our papers also include information on other types of pervious pavements (block pavers, particularly).