“Concrete in the 21st Century”

CONVENTION PROGRAM

1991 Spring Convention
March 17-21, 1991
Sheraton Boston Hotel & Towers
Boston, Massachusetts
AMERICAN CONCRETE INSTITUTE
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Portland Cement Association
Skokie, Illinois

Post-Tensioning Institute
Phoenix, Arizona
March 17, 1991

Dear Friends:

It gives me great pleasure to extend a warm Boston welcome to the American Concrete Institute’s 1991 Spring Convention. On behalf of the people of Boston, I want to thank you for selecting Boston as the site of this special event.

While you are in Boston, I encourage you to take advantage of the many historical and cultural opportunities which our city offers. The U.S.S. Constitution, our nation’s oldest commissioned naval ship, and the Marketplace at Historic Faneuil Hall are just two of the many interesting places to visit. I hope that you will have time in your busy convention schedule to explore our unique and beautiful city.

Again, Boston is proud to welcome the American Concrete Institute’s 1991 Spring Convention from March 17-21, 1991. We are pleased that you could be with us, and wish you the best success during your stay.

Sincerely,

Raymond L. Flynn
Mayor of Boston
Dear ACI Convention Attendees:

It's convention time again!

And what could be finer than to begin an ACI Convention in Boston on St. Patrick's Day! We hope you brought your shamrocks and shillelaghs with you in hopes that the luck of the Irish will prevail throughout the week.

But you don't have to be Irish to enjoy Boston or to partake in the learning experience at an Institute Convention. Boston is an historical, captivating city and we hope you will take the time to explore its many attractions and charms.

The Convention program, as usual, is crowded with meetings, technical sessions, forums, symposia, social events, spouse tours and much more. You'll find it difficult, but hopefully not impossible, to take in everything that you would like to experience. Chances are that this will be a hectic five or six days for you, but that's the hallmark of ACI Conventions — busy.

Don't forget to attend the Awards Breakfast, the "Hot Topic" Session and other technical sessions, and the many other events that have become traditional at Institute Conventions. The General Session is a must, including the Keynote Address by former Senator William Proxmire on "Challenges Facing American Business: The Savings and Loan Crisis," and the drawing for a free airline ticket to the Dallas Convention this fall. I'm seriously considering using my shillelagh instead of the President's gavel on Thursday, so don't pass up the General Session!

We want you to enjoy this time away from the office. Relax and explore the area, greet old friends again, and benefit from being with the world's leading concrete experts.

My wife, Mary, and I look forward to greeting each of you personally. Please feel free to ask if we, or anyone on the ACI staff or the New England Chapter's Convention Committee, can be of assistance.

And may the luck of the Irish shine upon us this week!

John M. Hanson
President
American Concrete Institute

March 1991
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March 17-21, 1991  
Sheraton Boston Hotel & Towers  
Boston, Massachusetts

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DIAMOND
ACI New England Chapter
W. R. Grace & Co. - Connecticut
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Conchem
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Northern New England Concrete Promotion Association
Pioneer Concrete/Fletcher Granite Co., Inc.

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ACI Northeast Texas Chapter
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ACI Puerto Rico Chapter
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Fosroc Precos
Glens Falls Cement Co., Inc.
Humboldt Manufacturing Co.
The George Hyman Construction Co.
Independent Cement Corp.
Kane-Perkins Co., Inc.
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PRM Concrete Corp.
Edward Page
Rowley Ready Mix, Inc.
L. M. Scofield Co.
Scott Concrete Products
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Wakefield Ready Mixed Concrete Co., Inc.
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Leonardo H. Suzio
The L. Suzio Concrete Co., Inc.

Past President
Alvin C. Ericson
Technical Consultant
Splice Sleeve North America, Inc.

The officers, staff, and members of ACI would like to thank the ACI New England Chapter for their contribution to a successful 1991 Spring Convention.

THANK YOU
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CONVENTION COMMITTEE

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W. R. Grace & Co.

Treasurer
Walter J. Staples
Rosenfeld Concrete Corp.

Finance Committee
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CWB Associates, Inc.

Russell H. Carlson
W. R. Grace & Co.

Kenn Hansen
Master Builders, Inc.

Rita L. Mikaelian
Precast/Prestressed Concrete Institute -
New England Region

Walter J. Staples
Rosenfeld Concrete Corp.

Jack Weber
Jack Weber Associates

Publicity
David Sprague
Northern New England Concrete Promotion Association

Technical Program
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CWB Associates, Inc.

John S. Colby
W. R. Grace & Co.

J. Graham Gurry
Master Builders, Inc.

Hospitality
Alvin C. Ericson
Technical Consultant - Splice Sleeve North America, Inc.

Rita L. Mikaelian
Precast/Prestressed Concrete Institute -
New England Region

continued
Spouse/Guest Program
Robert Bierweiler
Natgun Corp., Consultant

Elizabeth Bierweiler

Student Program
John Murphy
Wentworth Institute

Contractor Program
David Sprague
Northern New England Concrete Promotion Association

Wayne M. Tarr
McNamara Concrete

Special Assistants to the Chairman
Robert E. Gates
W. R. Grace & Co.

B. Duke Pointer
Pioneer Concrete/Fletcher Granite Co., Inc.

The officers, staff, and members of ACI would like to thank the Local Convention Committee, the Hostesses and the ACI New England Chapter for their contribution to a successful 1991 Spring Convention.

THANK YOU!
SPECIAL EVENTS

ST. PATRICK’S DAY PARADE
Sunday, March 17
Enjoy the world famous Boston St. Patrick’s Day Parade which begins at 1:00 PM at the Andrew “T” Station located on South Hampton and Ellery Streets. The parade will end at the Broadway “T” Station on West Broadway and Dorchester Avenues. Information regarding the parade will be available in the ACI Registration Area.

OPENING RECEPTION
Grand Ballroom
Sunday, March 17
5:30 PM - 7:00 PM
Welcome to Boston! Meet the ACI New England Chapter members as they host tonight’s event — and compliment them on a job well done!!

COFFEE BAR
ACI Registration Area
Monday through Thursday
8:00 AM - 10:00 AM
Join your colleagues for a little socializing before your morning meetings begin.

CONTRACTORS’ DAY LUNCHEON
Constitution
Tuesday, March 19
NOON - 2:00 PM
$18.00/person
Join us for lunch and listen to our speaker, James Becker, President of Beacon Construction, as he presents his topic “Up-Down Construction”. Please purchase your tickets by NOON on Monday.

REHABILITATION (Cash Bar)
Mass Bay
Tuesday, March 19
4:30 PM - 6:30 PM
After a long day of meetings, join your colleagues before your evening plans begin.

CONCRETE MIXER
Grand Ballroom
Wednesday, March 20
6:30 PM - 8:00 PM
The ACI New England Chapter invites you to a “Neighborhoods of Boston” party. Your ticket is complimentary with a full week’s registration fee.

AWARDS BREAKFAST
Grand Ballroom
Thursday, March 21
8:00 AM - 10:00 AM
$14.00/person
Come meet the awardees. Have fun and enjoy a good breakfast. Please purchase tickets by 5:00 PM Tuesday. See pages 81-82 for more details.

GENERAL SESSION AND Hynes Convention Center
STANDARDS PRESENTATION
Ballroom A
Thursday, March 21
10:00 AM - 1:00 PM
Come to the General Session and hear the Presidential Address given by John M. Hanson, the keynote address by Senator William Proxmire, and the announcement of new officers. After a brief break, the Standards Presentation will follow the General Session in the same room. See pages 83-84 for more details.
SPECIAL EVENTS

BY INVITATION ONLY

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ATTENTION CHAIRMEN AND SPEAKERS FOR THE ACI DALLAS CONVENTION...

Please join us for an informative training breakfast on Wednesday, March 20 in Republic A from 7:00 AM - 8:30 AM. See page 64 for more details.

SOCIAL ACTIVITIES PROGRAM

An excellent program has been planned by the ACI New England Chapter. Please purchase tour tickets in advance at the ACI Spouse/Guest Registration Desk. See pages 15-16 for further details.
REGISTRATION INFORMATION

The ACI staff is eager to answer any questions you may have pertaining to the convention. Our Registration Desk in the Republic Foyer is open to serve you during the following hours:

Sunday ........................................ 8:00 AM - 5:00 PM  
Monday ....................................... 7:30 AM - 5:00 PM  
Tuesday ....................................... 8:00 AM - 5:00 PM  
Wednesday .................................... 8:00 AM - 5:00 PM  
Thursday ....................................... 8:00 AM - 5:00 PM

BADGES

Wear your badge on the right side at all times. (In shaking hands, the eyes normally fall at the shoulder level on the right side of the individual being greeted.) The convention badges are color coded for identification as follows:

Member: White  
Nonmember: Peach  
Fellow: White  
Student: Blue  
Spouse: Beige

There will be non-smoking sections at each session. Please be courteous and smoke only in the designated sections.

Flash photography can be disturbing to other attendees. Please refrain from this activity during sessions.

The student registration fee does not entitle students to attend the Opening Reception or the Concrete Mixer.
SOCIAL ACTIVITIES PROGRAM

SUNDAY, March 17
9:00 AM - 5:00 PM  HAPPY ST. PATRICK’S DAY!!
Spouse/Guest Registration - Registration will be held in the
ACI Registration Area at the Sheraton Boston Hotel & Towers.

5:30 PM - 7:00 PM
Opening Reception - Enjoy a wine and cheese reception
sponsored by the ACI New England Chapter.

MONDAY, March 18
8:00 AM - 3:00 PM  Constitution
and
TUESDAY, March 19 through
THURSDAY, March 21
8:00 AM - NOON  Apley’s
Hospitality Room - Come join us for a continental breakfast
(8:30 AM to 10:00 AM daily). A host/hostess will be on hand
to register new guests and to answer questions. Maps will be
available.

MONDAY, March 18
10:00 AM - 11:00 AM  Commonwealth
Overview of Boston - Welcome to Boston, “Hub of the
Universe” and “Athens of America”! You will receive an
overview of this almost mystical city and its points of interest.
Information on sites, shopping and sporting events will be
available, and planned tours will be discussed.

3:00 PM - 5:00 PM
Afternoon Tea - In the Beacon Hill Suite, hosted by Mrs.
Mary Hanson. Casual attire.

TUESDAY, March 19
9:00 AM - 2:00 PM
Introduction to Boston - Look back to the beginnings of
American history. Travel through the Back Bay and the
financial district to such historic sites as the Public Garden,
the Old North Church, “Old Ironsides” the U.S. Constitution
and much more. Enjoy lunch and shopping on your own at
Faneuil Hall Marketplace. Buses back to the hotel will depart
on a shuttle schedule between NOON and 1:30 PM.
$21.00/person

2:00 PM - 5:00 PM
Tour Lexington and Concord - Enjoy the afternoon visiting
the famous sites in Lexington and Concord, including the
Minuteman statue, Lexington Green and the historic North
Bridge.
$15.00/person

NOTE:  These tour times were planned to enable you to
sign up for both tours if you would like.
SOCIAL ACTIVITIES PROGRAM

WEDNESDAY, March 20
9:00 AM - 4:00 PM
Tour Salem and Marblehead - Visit Salem, founded in 1626, and learn the background of the witchcraft hysteria. You will visit Nathaniel Hawthorne's House of Seven Gables, as well as the famous Peabody Museum and the historic wharf area. Then enjoy lunch on your own before continuing your journey to Marblehead, now a world class yachting capital.
$39.00/person

1:00 PM - 4:00 PM
Museum of Fine Arts and Gardner Museum - The Museum of Fine Arts houses one of the most outstanding collections of Chinese, Japanese and Egyptian art. Then tour the Isabella Stewart Gardner Museum, a private home built in 1903 housing priceless tapestries, sculptures and other works of art.
$29.00/person

6:30 PM - 8:00 PM
Concrete Mixer - Spend a festive evening with your friends and colleagues. Sponsored by the ACI New England Chapter.

THURSDAY, March 21
8:00 AM - 10:00 AM
Awards Breakfast - Come meet the awardees and enjoy a nice breakfast at the same time.
$14.00/person

9:00 AM - NOON
Cambridge Revisited Tour - Drive along the Charles River, see the campuses of MIT and Harvard, visit the Blaschka Glass Flowers collection at the Peabody Museum and the home of Henry Wadsworth Longfellow. You will also see one of the oldest homes in Cambridge, the Hopper Lee Nichols house built in 1685.
$20.00/person

9:00 AM - 3:00 PM
Shopping in Kittery, Maine - Shop at the discount malls in Kittery, Maine and discover values in china, crystal, ladies' and mens' wear, and much, much more. All stores are located within an area of about one square mile and guests will be shuttled back and forth to the bargains of their choice.
$24.00/person

10:00 AM - 1:00 PM
General Session
Please join us for the General Session. See page 83 for details.
No Charge

NOTE: ALL TOURS WILL DEPART FROM THE DALTON STREET ENTRANCE OF THE SHERATON BOSTON HOTEL & TOWERS.
HOW TO STAY STRONG IN A WEAK ECONOMY:
EDUCATION

1991 Seminars/Conferences

SEMINARS

How to Use the Newest Admixtures
   Atlanta (March 27), Salt Lake City (April 3), Phoenix (April 4), Overland Park (April 16), Seattle (April 24), New Orleans (May 14), and Silver Spring (May 21)

Troubleshooting Concrete Construction
   Toledo (March 28), Kansas City (April 9), St. Louis (April 10), Oakland (April 16), Albany (May 7), Albuquerque (fall)

Concrete Repair Basics
   Minneapolis (March 27), Chicago (March 28), Miami (April 4 - 5), Dallas (April 17), Oklahoma City (April 18), Philadelphia (April 23), Baltimore (April 25). Fall locations: Toledo, Silver Spring, Indianapolis, Cincinnati

How to Design and Build a Parking Structure That Will Last 50 Years
   Fall 1991 cities: Miami, Philadelphia, New Orleans, Denver, Salt Lake City, Boston, Meriden (CT), Tampa, Nashville

Hot and Cold Weather Concreting Techniques
   Fall 1991 cities: Salt Lake City, Dallas, Chicago, Baltimore, Phoenix

Design and Retrofit of Concrete for Seismic Loads
   Fall 1991 cities: San Francisco, Nashville, St. Louis, Atlanta

Design Basics for Structural Concrete
   Fall 1991 — call for details

CERTIFICATION TRAINING
Concrete Construction Inspector Level II Training Course
— to be announced

CONFERENCES


International Conference on Evaluation and Rehabilitation of Concrete Structures and Innovations in Design. December 4 - 6, 1991, Hong Kong, Republic of Hong Kong.

1991 ACI Fall Convention Special Seminars
   on Friday, November 15, 1991
Troubleshooting Concrete Construction
Design and Retrofit of Concrete for Seismic Loads

Call ACI Member Services for more information
313-532-2600
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# DAILY EVENTS

Be sure to check the bulletin board for last minute changes or added meetings.

## SATURDAY / SUNDAY

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<td>Educational Activities Committee (Mtg. 1)</td>
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<td>Construction Liaison</td>
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<td>Concrete Bridge Design</td>
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<td>1:00 PM-5:30 PM</td>
<td>Anchorage to Concrete</td>
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<td>2:00 PM-3:30 PM</td>
<td>Hot Topic Subcommittee</td>
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<td>2:00 PM-5:00 PM</td>
<td>TECHNICAL SESSION: Innovative Rehabilitation Technology for the 21st Century</td>
<td>Independence Center</td>
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<td>2:00 PM-5:00 PM</td>
<td>Joints and Connections in Monolithic R/C Structures</td>
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<td>Certification (Mtg. 1)</td>
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<td>History of Concrete</td>
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<td>Building Code Requirements for Structural Plain Concrete</td>
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* Theme Session
# SUNDAY / MONDAY

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<th>Day / Time</th>
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<tr>
<td>5:30 PM-7:00 PM</td>
<td>Opening Reception</td>
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<td>(Sponsored by the ACI New England Chapter)</td>
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<td>7:00 PM-8:30 PM</td>
<td>Concrete Bins &amp; Silos (Mtg. 1)</td>
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<td>7:00 PM-10:00 PM</td>
<td>Finite Element Analysis of Reinforced Concrete Structures</td>
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# MONDAY, MARCH 18, 1991

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<th>Time</th>
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<td>Technical Activities Committee (Mtg. 2)</td>
<td>Gardner A/B</td>
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<td>Pressure Vessels</td>
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<td>Student Concrete Projects</td>
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<td>Chemical Admixtures</td>
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<td>Residential Concrete</td>
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<td>Static Equipment Foundations</td>
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<td>Earthquake Resistance Members/Systems</td>
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<td>The Importance of Flow Properties and Flow Patterns in Silo Design</td>
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<td>New Developments in Concrete Pavements - Part I</td>
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<td>Structural and Design Analysis of Polymer Concrete</td>
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### MONDAY, MARCH 18, 1991

#### 2:00 PM-6:30 PM

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<td>Nondestructive Testing of Concrete</td>
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<td>Concrete Bins &amp; Silos (Mtg. 2)</td>
<td>Republic A</td>
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<td>Reinforcement and Development</td>
<td>Fairfax B</td>
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<td>318-B</td>
<td>Serviceability/Safety</td>
<td>Liberty C</td>
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<td>Flexure and Axial Loads</td>
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<td>Two-Way Slabs</td>
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<td>Subcommittee 2 (Mtg. 2)</td>
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#### 3:30 PM-5:00 PM

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<td>International Activities</td>
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<td>Properties &amp; Performance</td>
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<td>Hydraulic Cements</td>
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<td>Publications Committee</td>
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<td>303</td>
<td>Responsibility in Concrete Construction</td>
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<td>RC</td>
<td>Lightweight Concrete for Parking Structures and Bridge Decks</td>
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<td>213-B</td>
<td>Architectural CIP Concrete</td>
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<td>358</td>
<td>Concrete Guideways</td>
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#### 3:30 PM-6:30 PM

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<td>Mixture Submittal</td>
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<td>Flood Considerations Subcommittee</td>
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### TUESDAY, MARCH 19, 1991

#### 8:30 AM-10:00 AM

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<td>New Certification Programs</td>
<td>Dalton A</td>
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<td>Convention Training</td>
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<td>211-A</td>
<td>Edit and Coordination</td>
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<td>Radioactive/Hazardous Waste Management</td>
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<td>308-S</td>
<td>Specification</td>
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<td>325-04</td>
<td>Jointed Concrete Pavement Design</td>
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<td>Rehabilitation</td>
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<td>Durability of Concrete</td>
<td>Grand Ballroom</td>
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<td>Controlled Low-Strength Material</td>
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<td>Design of Slabs on Grade</td>
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TUESDAY

Day / Time  Function

TUESDAY, MARCH 19, 1991

8:30 AM-1:00 PM

318-A  General, Concrete Construction  Hampton A
313   Concrete Bins & Silos (Mtg. 3)  Republic A
318-E  Shear and Torsion  Beacon G
318-G  Prestressed Precast  Beacon F
318-H  Seismic Provisions  Hampton B
349   Nuclear Structures  Liberty A

9:00 AM-NOON  TECHNICAL SESSIONS:

* Material Science and Modeling in Concrete I: Permeability and Porosity  Independence East
* Computer Applications in Concrete Technology - Part I  Independence West
* New Developments in Fiber Reinforced Concrete for the 21st Century - Part I  Independence Center
* Design of Concrete Shells: 1955-1990  Fairfax A

Specification Workshop  Commonwealth

10:00 AM-11:30 AM

Proposed Committee on Plastic Reinforcement  Gardner B
122   Energy Conservation  Dalton A
216   Fire Resistance and Fire Protection of Structures  Berkeley A
308-R  State-of-the-Art Report  Liberty C
363   High Strength Concrete  Fairfax B

10:00 AM-1:00 PM

E902  Certification (Mtg. 2)  Beacon C
231   Properties of Concrete at Early Ages  Gardner A
307   Chimneys  Clarendon B
548-B  Polymer Concrete Overlays  Beacon D

10:00 AM-1:30 PM

CAC  Chapter Activities Committee  Liberty D

11:30 AM-1:00 PM

126  Concrete Materials Property Database  Gardner B
211-C  No Slump  Berkeley A
308   Curing Concrete  Liberty C
350-6  Education Subcommittee  Dalton A
545   Railroad Ties  Liberty E

NOON-2:00 PM

Contractors' Day Luncheon  Constitution

* Theme Session

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# TUESDAY

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<td>OPEN DISCUSSION: Long Range Plan</td>
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<td>211-B Lightweight</td>
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<td>309-1 Cons. of Congested Areas</td>
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<td>325-07 Roller Compacted Concrete</td>
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<td>351 Foundations for Equip. and Machinery</td>
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<td>554 Bearing Systems</td>
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<td>TECHNICAL SESSIONS/FORUM: Material Science and Modeling in Concrete II: Overview</td>
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<td>Computer Applications in Concrete Technology - Part II</td>
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<td>New Developments in Fiber Reinforced Concrete for the 21st Century - Part II</td>
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<td>Computer-Aided Design of Concrete Shells</td>
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<td>Forum: Architectural Concrete Construction</td>
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<td>330 Parking Lots</td>
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<td>345 Bridge Construction</td>
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<td>362 Parking Structures</td>
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<td>546 Repair of Concrete</td>
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<td>548 Polymers in Concrete</td>
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<td>325-11 Fast Track Concrete Pavements &amp; Overlays</td>
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<td>Certification (Mtg. 3)</td>
<td>Beacon C</td>
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<td>5:00 PM-6:30 PM</td>
<td>Corrosion of Metals in Concrete</td>
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<td>5:00 PM-6:30 PM</td>
<td>Drainage of Concrete Pavements</td>
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<tr>
<td>5:00 PM-6:30 PM</td>
<td>Joint Sealants and Joint Systems</td>
<td>Liberty D</td>
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<tr>
<td>7:00 PM-10:00 PM</td>
<td>Concrete Esthetics</td>
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<td>7:30 PM-10:00 PM</td>
<td>FORUM: Cutting Edge Research - Where is it Leading Us?</td>
<td>Commonwealth</td>
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**WEDNESDAY, MARCH 20, 1991**

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>8:30 AM-1:00 PM</td>
<td>Tolerances</td>
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<td>Prestressed Concrete</td>
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<td>8:30 AM-10:00 AM</td>
<td>Eval. of Consolidation</td>
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<td>Cold Weather Concreting</td>
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<td>Details of Concrete Reinforcement</td>
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<td>Reinforced Concrete Columns</td>
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9:00 AM-NOON TECHNICAL SESSIONS:

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<tr>
<td>Meeting Transportation and Environmental Needs for the 21st Century</td>
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<tr>
<td>The Expanding World of Shrinkage-Compensating Concrete</td>
<td>Independence West</td>
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<tr>
<td>Lunar Concrete - Part I</td>
<td>Commonwealth</td>
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<tr>
<td>Material Science and Modeling in Concrete III: Materials and Processing</td>
<td>Independence East</td>
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<tr>
<td>Experimental Techniques: Traditional Approaches</td>
<td>Independence Center</td>
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9:00 AM-5:00 PM

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<tr>
<td>10:00 AM-11:30 AM</td>
<td>Consolidation of RCC</td>
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<td>Natural Pozzolans in Concrete</td>
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<tr>
<td>11:30 AM-1:00 PM</td>
<td>Consolidation of Concrete</td>
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<tr>
<td>11:30 AM-1:00 PM</td>
<td>Accelerated Curing</td>
<td>Kent</td>
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WEDNESDAY

Day / Time Function

WEDNESDAY, MARCH 20, 1991

12:45 PM-1:45 PM  SEMINAR:
   Effective Presentations                       Fairfax A

1:00 PM-5:00 PM  TAC Specifications Committee
   Conference

2:00 PM-3:30 PM
   E701  Construction Materials                   Exeter A
   118-UG  Computer Users Group                    Jefferson
   232  Fly Ash and Natural Pozzolans in Concrete  Republic B
   348  Structural Safety                          Beacon C
   437  Strength Evaluation of Existing
        Concrete Structures       Board
   446-2  Fracture Mechanics and the Code         Exeter B
   552  Geotechnical Cement Grouting               Kent

2:00 PM-5:00 PM  TECHNICAL SESSIONS:
   Concrete Issues for the 21st Century:  Fairfax A
   High Performance Concrete in Structures
   and the Environment
   Open Paper Session                           Independence West

2:00 PM-5:00 PM
   Lunar Concrete - Part II                     Commonwealth

2:00 PM-5:00 PM
   Material Science and Modeling
   in Concrete IV: Strength and Fracture
   Mechanics                                    Independence East
   Experimental Techniques:                     Independence Center
   NDE Approaches

2:00 PM-5:00 PM
   Creep and Shrinkage in Concrete               Liberty D
   439  Steel Reinforcement                      Gardner B
   442  Lateral Forces                           Liberty E
   503  Adhesives for Concrete                   Liberty C
   547  Refractory Concrete (Mtg. 1)             Beacon H
   551  Tilt-Up Concrete Construction            Clarendon A

2:00 PM-6:30 PM
   Plastering (Mtg. 2)                           Clarendon B

3:30 PM-5:00 PM
   Terminology and Notation                      Berkeley A

3:30 PM-6:30 PM
   Use of Computers                               Jefferson
   211  Proportioning Concrete Mixtures          Republic A
   435  Deflection                                Board
   446  Fracture Mechanics (Mtg. 1)               Fairfax B

5:00 PM-6:30 PM
   Service Life Prediction                       Gardner B

6:30 PM-8:00 PM  Concrete Mixer
   (Sponsored by the ACI New England Chapter)
   Grand Ballroom

28  Theme Session
THURSDAY, MARCH 21, 1991

8:00 AM-10:00 AM
Awards Breakfast

10:00 AM-1:00 PM
General Session and Standards Presentation

1:00 PM-3:30 PM
Standards Board

2:00 PM-3:30 PM
221 Aggregates
357 Offshore and Marine Concrete

2:00 PM-4:00 PM TECHNICAL SESSION:
* Fracture Mechanics of Dams

2:00 PM-5:00 PM TECHNICAL SESSIONS:
Connections Between Precast Concrete Elements
Detection of Chloride-Induced Corrosion and Related Deterioration
Fire Resistance of Materials and/or Members Made with High-Strength Concrete

2:00 PM-5:00 PM
Board of Direction (New)
123 Research
234 Silica Fume in Concrete
304 Meas., Mix., Transp., and Placing
305 Hot Weather Concreting
359 Nuclear Vessels
444 Models of Concrete Structures
547 Refractory Concrete (Mtg. 2)

2:00 PM-5:30 PM TECHNICAL SESSION:
* Shotcrete in the 21st Century

2:00 PM-6:30 PM
125 Lunar Concrete
301 Specifications for Concrete
311 Inspection of Concrete

5:00 PM-7:00 PM
446 Fracture Mechanics (Mtg. 2)

NOTE: Committees not listed did not request a meeting at this convention or the committee has requested a closed meeting. Those committees having closed meetings have received a closed meeting schedule.
<table>
<thead>
<tr>
<th>COMM.</th>
<th>COMMITTEE TITLE</th>
<th>DAY</th>
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<tr>
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<td>WED</td>
<td>3:30P- 6:30P</td>
<td>Fairfax B</td>
</tr>
<tr>
<td>446</td>
<td>Fracture Mechanics (Mtg. 2)</td>
<td>THU</td>
<td>5:00P- 7:00P</td>
<td>Berkeley B</td>
</tr>
<tr>
<td>446-2</td>
<td>Fracture Mechanics and the Code</td>
<td>WED</td>
<td>2:00P- 3:30P</td>
<td>Exeter B</td>
</tr>
<tr>
<td>447</td>
<td>Finite Element Analysis of Reinforced Concrete Structures</td>
<td>SUN</td>
<td>7:00P- 10:00P</td>
<td>Jefferson</td>
</tr>
<tr>
<td>503</td>
<td>Adhesives for Concrete Joint Sealants and Joint Systems</td>
<td>WED</td>
<td>2:00P- 5:00P</td>
<td>Liberty C</td>
</tr>
<tr>
<td>504</td>
<td>Joint Sealants and Joint Systems</td>
<td>TUE</td>
<td>5:00P- 6:30P</td>
<td>Liberty D</td>
</tr>
<tr>
<td>COMM.</td>
<td>COMMITTEE TITLE</td>
<td>DAY</td>
<td>TIME</td>
<td>ROOM</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td>506</td>
<td>Shotcreting</td>
<td>MON</td>
<td>8:30A-1:00P</td>
<td>Beacon H</td>
</tr>
<tr>
<td>515</td>
<td>Coatings for Concrete</td>
<td>MON</td>
<td>8:30A-11:30A</td>
<td>Liberty E</td>
</tr>
<tr>
<td>517</td>
<td>Accelerated Curing</td>
<td>WED</td>
<td>11:30A-1:00P</td>
<td>Kent</td>
</tr>
<tr>
<td>523</td>
<td>Insulating and Cellular Concrete</td>
<td>MON</td>
<td>8:30A-11:30A</td>
<td>Exeter B</td>
</tr>
<tr>
<td>524</td>
<td>Plastering (Mtg. 1)</td>
<td>TUE</td>
<td>2:00P-6:30P</td>
<td>Kent</td>
</tr>
<tr>
<td>524</td>
<td>Plastering (Mtg. 2)</td>
<td>WED</td>
<td>2:00P-6:30P</td>
<td>Clarendon B</td>
</tr>
<tr>
<td>531</td>
<td>Concrete Masonry</td>
<td>MON</td>
<td>2:00P-6:30P</td>
<td>Liberty E</td>
</tr>
<tr>
<td>533</td>
<td>Precast Panels</td>
<td>MON</td>
<td>2:00P-5:00P</td>
<td>Exeter B</td>
</tr>
<tr>
<td>543</td>
<td>Concrete Piles</td>
<td>MON</td>
<td>3:30P-6:30P</td>
<td>Kent</td>
</tr>
<tr>
<td>544</td>
<td>Fiber Reinforced Conc.</td>
<td>MON</td>
<td>2:00P-6:30P</td>
<td>Republic B</td>
</tr>
<tr>
<td>544-A</td>
<td>Steel Fibers</td>
<td>MON</td>
<td>8:30A-10:00A</td>
<td>Fairfax B</td>
</tr>
<tr>
<td>544-B</td>
<td>Glass Fibers</td>
<td>MON</td>
<td>8:30A-10:00A</td>
<td>Beacon F</td>
</tr>
<tr>
<td>544-C</td>
<td>Synthetic Fibers</td>
<td>MON</td>
<td>10:00A-11:30A</td>
<td>Fairfax B</td>
</tr>
<tr>
<td>544-H</td>
<td>Structural Uses of FRC</td>
<td>MON</td>
<td>10:00A-11:30A</td>
<td>Hampton A</td>
</tr>
<tr>
<td>544-E</td>
<td>State-of-the-Art Report</td>
<td>MON</td>
<td>11:30A-1:00P</td>
<td>Hampton A</td>
</tr>
<tr>
<td>545</td>
<td>Railroad Ties</td>
<td>TUE</td>
<td>11:30A-1:00P</td>
<td>Liberty E</td>
</tr>
<tr>
<td>546</td>
<td>Repair of Concrete</td>
<td>TUE</td>
<td>2:00P-6:30P</td>
<td>Grand Blm.</td>
</tr>
<tr>
<td>547</td>
<td>Refractory Concrete</td>
<td>WED</td>
<td>2:00P-5:00P</td>
<td>Beacon H</td>
</tr>
<tr>
<td>547</td>
<td>Refractory Concrete (Mtg. 1)</td>
<td>THU</td>
<td>2:00P-5:00P</td>
<td>Beacon H</td>
</tr>
<tr>
<td>548</td>
<td>Polymers in Concrete</td>
<td>TUE</td>
<td>3:30P-6:30P</td>
<td>Gardner B</td>
</tr>
<tr>
<td>548-A</td>
<td>Polymer Modified Conc.</td>
<td>MON</td>
<td>8:30A-11:30A</td>
<td>Beacon D</td>
</tr>
<tr>
<td>548-B</td>
<td>Polymer Conc. Overlays</td>
<td>TUE</td>
<td>10:00A-1:00P</td>
<td>Beacon D</td>
</tr>
<tr>
<td>548-D</td>
<td>Sulfur Concrete</td>
<td>TUE</td>
<td>8:30A-10:00A</td>
<td>Dalton B</td>
</tr>
<tr>
<td>548-E</td>
<td>Structural and Design</td>
<td>MON</td>
<td>2:00P-5:00P</td>
<td>Beacon D</td>
</tr>
<tr>
<td>549</td>
<td>Analysis of Polymer Conc.</td>
<td>WED</td>
<td>8:30A-11:30A</td>
<td>Beacon D</td>
</tr>
<tr>
<td>550</td>
<td>Precast Conc. Structures</td>
<td>WED</td>
<td>8:30A-11:30A</td>
<td>Beard</td>
</tr>
<tr>
<td>551</td>
<td>Tilt-Up Concrete Const.</td>
<td>WED</td>
<td>2:00P-5:00P</td>
<td>Clarendon A</td>
</tr>
<tr>
<td>552</td>
<td>Geotechnical Cement Grouting</td>
<td>WED</td>
<td>2:00P-3:30P</td>
<td>Kent</td>
</tr>
<tr>
<td>554</td>
<td>Bearing Systems</td>
<td>TUE</td>
<td>2:00P-3:30P</td>
<td>Liberty D</td>
</tr>
<tr>
<td>555</td>
<td>Removed and Reuse of Concrete</td>
<td>MON</td>
<td>2:00P-5:00P</td>
<td>Conference</td>
</tr>
<tr>
<td></td>
<td>Ad Hoc Committee on Short Duration Dynamic &amp; Vibratory Load Effects</td>
<td>SUN</td>
<td>2:00P-5:00P</td>
<td>Jefferson</td>
</tr>
<tr>
<td></td>
<td>Proposed Committee on Fiber Reinforced Plastic Reinforcement</td>
<td>TUE</td>
<td>10:00A-11:30A</td>
<td>Gardner B</td>
</tr>
</tbody>
</table>

**NOTE:** Committees not listed did not request a meeting at this convention or the committee has requested a closed meeting. Those committees having closed meetings have received a closed meeting schedule.
TECHNICAL SESSION

SUNDAY, March 17
2:00 PM - 5:00 PM
Room: Independence Center

INNOVATIVE REHABILITATION TECHNOLOGY FOR THE 21ST CENTURY

Sponsored by Committee 364

Session Chairman: Ashok K. Dhandra
Vice President
James M. Montgomery,
Consulting Engineers, Inc.
Pasadena, California

Introduction
Ashok K. Dhandra, Vice President, James M.
Montgomery, Consulting Engineers, Inc.,
Pasadena, California

Rehabilitation of Reinforced Concrete Parking Structures Using Cathodic Protection
Philip J. Zivich, Principal Marketing Engineer,
ELGARD Corp., Chardon, Ohio

Rehabilitation of the Worcester Market Building,
Worcester, Massachusetts
David P. Herr, Principal, D. H. Engineering Associates,
Boston, Massachusetts

Strengthening of Concrete Structures with Prestressed CFRP Sheets
Thanasis C. Triantafillou, Assistant Professor of Civil Engineering, Massachusetts Institute of Technology,
Cambridge, Massachusetts

Innovative Concrete Slab Strengthening Using Unbonded Post-Tensioning
Florian G. Barth, President,
Bijan, Florian & Associates, Inc.,
Redwood City, California

Rehabilitation of Transit Structures —
Old Problems and Innovative Solutions
Mysore Nagaraja, Deputy Vice President and Chief Engineer, New York Transit Authority,
New York, New York
THE IMPORTANCE OF FLOW PROPERTIES AND FLOW PATTERNS IN SILO DESIGN

Sponsored by Committee 313

Session Chairman: John W. Carson
Jenike & Johanson, Inc.
North Billerica, Massachusetts

Session Co-Chairman: David J. Goodwill
Jenike & Johanson, Ltd.
Etobicoke, Ontario, Canada

Introduction
John E. Sadler, Consulting Engineer, Columbus, Ohio

Current Challenges in the Development of Codes for Silo Loads
J. Michael Rotter, Professor, University of Edinburgh,
Edinburgh, Scotland, and Jørgen Nielsen, Ph.D.,
Danish Building Research Institute, Horsholm, Denmark

Analysis of Silo Failures from Asymmetric Flow
F. Thomas Johnston, President, Facility Design, Inc.,
Columbus, Ohio

Predicting the Shape of Flow Channels in Funnel Flow Bins
John W. Carson, President, Jenike & Johanson, Inc.,
North Billerica, Massachusetts; David Dick, Consulting Engineer, Jenike & Johanson, Inc., San Louis Obispo, California; and David J. Goodwill, President, Jenike & Johanson Ltd., Etobicoke, Ontario, Canada

Estimating Wall Bending Moments Due to Continuity Between Connected Silos
Judith J. Stalnaker, Assistant Professor, and Ernest C. Harris, Professor Emeritus, Department of Civil Engineering, University of Colorado, Denver, Colorado

New Silo Theory Based on the Development of Expansion Zones
I.A.S.Z. Peschel, President, Siloproject BV, Sterksel, Holland

Future Revisions to Chapter 4 of ACI 313
Mostafa H. Mahmoud, Vice President, SEI Engineers, Inc., Worthington, Ohio
CONCRETE AND GROUTS IN NUCLEAR AND HAZARDOUS WASTE DISPOSAL — PART I

Considerations for the Design and Construction of a Reinforced Concrete Low-Level Waste Facility
L. W. Grindstaff, Senior Engineer; N. J. Antonas, Senior Engineer; and S. St. John, Engineer, Bechtel National, Inc., Oak Ridge, Tennessee

Performance of Reinforced Concrete Structures in Low-Level Radioactive Waste Disposal Units
N. Chau, Senior Engineer; R. D. Baird, Project Manager; and V. C. Rogers, President, Rogers & Associates Engineering Corp., Salt Lake City, Utah

Leaching of Concrete in Used Fuel Storage Bay
Ladislav Konceny, Design Engineer, Radioactive Materials Management Section, Ontario Hydro, Toronto, Ontario, Canada

Creep and Shrinkage of Cement-Based Grouts Containing Silica Fume at High Temperatures
Akthom Al-Manaseer, Associate Professor, Department of Civil Engineering, Bradley University, Peoria, Illinois; K. W. Nasser, Professor, Department of Civil Engineering, University of Saskatchewan, Saskatoon, Saskatchewan, Canada; and M. N. Gray, Head, Vault Sealing Program, Atomic Energy of Canada, Pinawa, Manitoba, Canada

continued
MONDAY, March 18
9:00 AM - NOON

CONCRETE AND GROUTS IN NUCLEAR AND HAZARDOUS WASTE DISPOSAL — PART I

Sponsored by Committee 227

continued

T. e Computer Model for Predicting Long-Term Performance of Reinforced Concrete Structures 11:00
R. Shuman, Senior Scientist; V. C. Rogers, President; and N. Chau, Senior Engineer, Rogers and Associates Engineering Corp., Salt Lake City, Utah

Alteration of Underground Concrete by Magnesium Brine 11:30
Lillian D. Wakeley, Chief, Engineering Sciences Branch; Toy S. Poole, Engineering Materials Group Leader; and J. Pete Burkes, Geologist, Engineering Sciences Branch, U. S. Army Waterways Experiment Station, Vicksburg, Mississippi
ARCHITECTURAL PRECAST CONCRETE
DESIGN CONSIDERATIONS

Sponsored by Committee 533

Session Chairman: Sidney Freedman
Director
Architectural Precast Concrete Services
Precast/Prestressed Concrete Institute
Chicago, Illinois

Introduction 9:00
Sidney Freedman, Director,
Architectural Precast Concrete Services,
Precast/Prestressed Concrete Institute,
Chicago, Illinois

Design Responsibility and Structural Design Considerations 9:05
Donald F. Meinheir, Senior Consultant,
Wiss, Janney, Elstner Associates, Inc.,
Northbrook, Illinois

Reinforcement and Connection Design 9:50
Michael D. Abbuzese, Vice President,
Engineering, Art Cement Products Co., Inc.,
Wilbraham, Massachusetts

Performance of Precast Concrete Cladding in Recent Earthquakes 10:30
Barry J. Goodno, Professor,
School of Civil Engineering,
Georgia Institute of Technology,
Atlanta, Georgia

Surface Aesthetics 11:15
Sidney Freedman, Director,
Architectural Precast Concrete Services,
Precast/Prestressed Concrete Institute,
Chicago, Illinois
NEW DEVELOPMENTS IN CONCRETE PAVEMENTS — PART I

Sponsored by Committee 325

Session Chairman:
Amir N. Hanna
Senior Staff Engineer
Strategic Highway Research Program
National Academy of Sciences/
National Research Council
Washington, D.C.

Introduction
Amir N. Hanna, Senior Staff Engineer, Strategic
Highway Research Program, National Academy of
Sciences/National Research Council, Washington, D.C.

SHRP Long-Term Performance Studies of
Portland Cement Concrete Pavements
Amir N. Hanna, Senior Staff Engineer, Strategic
Highway Research Program, National Academy of
Sciences/National Research Council, Washington, D.C.

An Expert System for Concrete Pavement Evaluation
and Rehabilitation
K. T. Hall, Research Assistant, and Michael I. Darter,
Professor, Department of Civil Engineering, University
of Illinois at Urbana-Champaign, Urbana, Illinois

Reinforced Concrete Pavements — Realistic Design
M. Nasser Darwish, Lecturer, Department of Civil
Engineering, Alexandria University, Alexandria, Egypt

Prestressed Concrete Pavement —
Design, Construction and Performance
Ned H. Burns, Associate Dean of Engineering, and B.
Frank McCullough, Director, Center for Transportation
Research, The University of Texas at Austin,
Austin, Texas

Rigid Pavement Response to Simulated Loads
from Motor Vehicles
M. A. Bhatti, Associate Professor; I. Molinas-Vega,
Graduate Student; and J. W. Stoner, Associate
Professor, Department of Civil and Environmental
Engineering, University of Iowa, Iowa City, Iowa

Performance Specifications
James M. Shilstone, Sr., President,
Shilstone & Associates, Inc., Dallas, Texas

* Theme Session
TECHNICAL SESSION

MONDAY, March 18
Room: Commonwealth
2:00 PM - 5:00 PM

THE 3 R'S: REPAIR, RESTORATION AND REHABILITATION

Sponsored by the Convention Committee and the
ACI New England Chapter

Session Chairman: Peter G. Snow
President
PGS & Associates, Inc.
Riviera Beach, Florida

Session Co-Chairman: John S. Colby
Engineering Specialist
W. R. Grace & Co.
Cambridge, Massachusetts

Introduction
Peter G. Snow, President, PGS & Associates, Inc.,
Riviera Beach, Florida

ACI International Conference on Evaluation and
Rehabilitation of Concrete Structures and
Innovations in Design
William R. Tolley, Senior Managing Director,
Operations and Services, American Concrete Institute,
Detroit, Michigan

Economic Overview: Understanding the Market
Niches for Financial Success in the 1990's
Peter H. Emmons, President, Structural Preservation
Systems, Inc., Baltimore, Maryland

Rehabilitation and Restoration of a Water Storage
Tank Built in 1927
Ashok K. Dhillon, Vice President,
James M. Montgomery, Consulting Engineers, Inc.,
Pasadena, California

Historical Research: A Key to Successful Retrofitting
Jose M. Izquierdo, Partner, Izquierdo,
Rueda & Associates Consulting Engineers,
Rio Piedras, Puerto Rico

Rehabilitation and Modernization of Existing Subways:
Developing Technology
Minhaj Kirmani, Principal, Weidlinger Associates,
Cambridge, Massachusetts

continued
MONDAY, March 18
2:00 PM - 5:00 PM
Room: Commonwealth

THE 3 R'S: REPAIR, RESTORATION AND REHABILITATION

Sponsored by the Convention Committee and the ACI New England Chapter

continued

Structural Retrofitting of a Nine-Story Building in San Juan: Design Considerations 3:30
Bernardo Deschapelles, Partner, Molina, Garcia & Associates, San Juan, Puerto Rico

Structural Retrofitting of a Nine-Story Building in San Juan: Construction Considerations 3:50
Jose A. Del Rosario, President, Edificadora, Inc., San Juan, Puerto Rico

Application of New Technology in Rehabilitation of Hydraulic Structures 4:10
James E. McDonald, Research Civil Engineer, U. S. Army Waterways Experiment Station, Vicksburg, Mississippi

Questions and Answers 4:30

** Hot Topic
CONCRETE AND GROUTS IN NUCLEAR AND HAZARDOUS WASTE DISPOSAL — PART II

Sponsored by Committee 227

Session Chair: Della M. Roy
Professor of Materials Science
Materials Research Laboratory
The Pennsylvania State University
University Park, Pennsylvania

Session Co-Chairman: Akthem Al-Manaseer
Associate Professor
Department of Civil Engineering
Bradley University
Peoria, Illinois

Properties of Slag Concrete for Low-Level Waste Containment
C. A. Langton, Principal Scientist, and P. B. Wong,
Senior Engineer, Westinghouse Savannah River Co.,
Aiken, South Carolina

Cemented Waste Forms for C-14 Reactor Waste
R. Dayal, Senior Geochemist, Rock Sciences Section,
Civil Research Department, Ontario Hydro, Toronto,
Ontario, Canada

Characterization of a Sodium Silicate Activated Cement - Aluminosilicate Low-Level Radioactive Waste Form
Barry E. Scheetz, Associate Professor, Materials Research Laboratory, The Pennsylvania State University, University Park, Pennsylvania, and Jefferson P. Hoffer, Nittany Geosciences, State College, Pennsylvania

Strength of Concrete Containing Petroleum Contaminated Soils
A. Samer Ezeldin, Assistant Professor, Department of Civil, Environmental, and Coastal Engineering, Stevens Institute of Technology, Hoboken, New Jersey

Effect of Fly Ash on the Permeability Characteristics of Concrete
Parviz Soroushian, Associate Professor, and Abdulrahman Alhozalmy, Department of Civil and Environmental Engineering, Michigan State University, East Lansing, Michigan

Solidification/Stabilization of KO61 Arc Dust by Silica Fume Concrete
Ziad Bayasi, Assistant Professor, Department of Civil Engineering, San Diego State University, San Diego, California, and Robert Fuessle, Associate Professor, Department of Civil Engineering, Bradley University, Peoria, Illinois
NEW DEVELOPMENTS IN CONCRETE PAVEMENTS — PART II

Sponsored by Committee 325

Session Chairman: Ralph L. Duncan
Consultant
Springfield, Illinois

Introduction
Ralph L. Duncan, Consultant, Springfield, Illinois

Roller Compacted Concrete Pavements:
Future Directions
Shiraz D. Tayabji, Division Manager, PCS/Law Engineering, Beltsville, Maryland

SHRP Research on Concrete for Highway Pavements
Amir N. Hanna, Senior Staff Engineer, and Inam Jawed, Senior Staff Engineer, Strategic Highway Research Program, National Academy of Sciences/National Research Council, Washington, D.C.

Interlocking Concrete Pavements for Airfields
David R. Smith, Director, Paving Products, Concrete Paver Institute, Herndon, Virginia, and Mark Smallridge, Director, Nigel Hixon & Partners, London, England

Control of Cracking Related to Dowels and Tie-Bars
Ernest K. Schrader, Civil Engineer and Concrete Specialist, Schrader Consulting, Walla Walla, Washington

Effects of Aggregate Type and Gradation on the Deterioration of Transverse Cracks in Jointed Reinforced Concrete Pavement
Zafar I. Raja, Graduate Research Assistant, and Mark B. Snyder, Assistant Professor, Department of Civil and Environmental Engineering, Michigan State University, East Lansing, Michigan

Properties of Shrinkage Compensating Silica Fume Concrete
M. Ziad Bayasi, Assistant Professor; Osama M. Rabie, Doctoral Candidate; and Fouad Beylouni, Post-Doctoral Fellow, Department of Civil Engineering, San Diego State University, San Diego, California

* Theme Session
TECHNICAL SESSION

MONDAY, March 18
2:00 PM - 5:30 PM
Room: Independence Center

RESEARCH IN PROGRESS

Sponsored by Committee 123

Session Chairman: Jan Olek
Assistant Professor
Department of Engineering
Colorado School of Mines
Golden, Colorado

Presentation of ACI – James Instruments Award 1990 by Committee 228
Awarded to P. A. Muhammed Basheer,
Department of Civil Engineering, University of Belfast,
Northern Ireland, United Kingdom

Analyzing and Optimizing the Hydration Rate of Granulated Iron Slag
Paul J. Seppanen, Student, Winona High School,
Winona, Minnesota

Brittle-Ductile Transition of Polymer Concrete
S. T. Mau, Professor; S. Wei, Graduate Student; and
C. Vipulanandan, Associate Professor, Department of Civil and Environmental Engineering, University of Houston, Houston, Texas

Mechanical Resistance of Micro-Fiber Reinforced Cements and Mortars
Nemkumar Banthia, Assistant Research Professor,
Department of Civil Engineering, Laval University,
Ste-Foy, Quebec, Canada, and Yoshihiko Ohama,
Professor, Department of Architecture, Nihon University, Fukushima-Ken, Koriyama, Japan

Cyclic Response of Fiber Reinforced Concrete Joints in Precast Construction
Khaled Soubra, Graduate Student; James K. Wight, Professor; and A. E. Naaman, Professor, Department of Civil Engineering, The University of Michigan,
Ann Arbor, Michigan

Evaluation of Fiber Reinforced Concrete in Seismic Design
André Filiatrault, Assistant Professor, Department of Civil Engineering, École Polytechnique, University of Montreal, Montreal, Quebec, Canada; B. Katzensteiner,
Graduate Research Assistant; N. D. Nathan, Professor; and Sidney Mindess, Professor, Department of Civil Engineering, University of British Columbia, Vancouver,
British Columbia, Canada; and Nemkumar Banthia, Assistant Research Professor, Department of Civil Engineering, Laval University, Ste-Foy, Quebec, Canada

continued
TECHNICAL SESSION

MONDAY, March 18
2:00 PM - 5:30 PM

Room: Independence Center

RESEARCH IN PROGRESS

Sponsored by Committee 123

Toughness Indices of Fiber Reinforced Concrete
Using a New Test Procedure
P. N. Balaguru, Professor; M. Patel, Graduate Student; and R. Narahari, Graduate Student, Department of Civil and Environmental Engineering, Rutgers, The State University of New Jersey, Piscataway, New Jersey

Testing of Compressive Strength for High-Strength Concrete
Paul H. Read, Head, Research and Development, and B. Chojnacki, Senior Consultant, Concrete Technology Division, Trow, Inc., Toronto, Ontario, Canada; G. G. Carette, Senior Materials Engineer, and V. M. Malhotra, Head, Concrete Technology Section, CANMET, Ottawa, Ontario, Canada

Bond Performance of Deformed Reinforcing Bars Using Ultra-High-Strength Concrete
Atorod Azizinamini, Assistant Professor, and Mark Stark, Graduate Student, Department of Civil Engineering, University of Nebraska-Lincoln, Lincoln, Nebraska

In-Place Testing for Highway Structures
Paul H. Read, Head, Research and Development, and Randa Omran, Research Engineer, Concrete Technology Division, Trow, Inc., Toronto, Ontario, Canada; and John A. Bickley, President, John A. Bickley Associates Ltd., Toronto, Ontario, Canada

Application of Aramid Fiber Flexible Rods in Prestressed Concrete
Antonio Nanni, Visiting Researcher; M. Tanigaki, Senior Research Engineer; and T. Okamoto, Principal Research Engineer, Technical Research Institute, Mitsui Construction Co., Ltd., Nagareyama-City, Japan

* Theme Session
TECHNICAL SESSION

TUESDAY, March 19
9:00 AM - NOON

Room: Independence West

COMPUTER APPLICATIONS IN CONCRETE TECHNOLOGY — PART 1

Sponsored by Committee 118

Session Chairman:  Thomas H. Wenzel
                   Associate Professor
                   Department of Civil Engineering
                   Marquette University
                   Milwaukee, Wisconsin

Introduction
Thomas H. Wenzel, Associate Professor,
Department of Civil Engineering, Marquette University,
Milwaukee, Wisconsin

Algorithms for the Automatic Design/Detailing of Two-Dimensional R/C Elements
Michael N. Fardis, Professor, Department of Civil Engineering, University of Patras, Patras, Greece, and
A. Harisis, Civil Engineer, Athens, Greece

Computational Modeling of Inelastic Seismic Response of R/C Buildings with In-Plane Floor Flexibility
Sashi Kunnath, Research Assistant Professor, and
Andrei Reinhorn, Professor, State University of New York at Buffalo, Buffalo, New York; and Nader
Panahzadeh, Assistant Professor, Southern Illinois University at Edwardsville, Edwardsville, Illinois

Computer Monitoring the Micro-Environment of Concrete
Ronald G. Grieve, President, Tektron Services, Inc.,
Mississauga, Ontario, Canada

Project Concrete Quality Assurance System (PCQAS)
William F. Kepler, Civil Engineer, U. S. Bureau of
Reclamation, Denver, Colorado

Analysis of Circular Tanks for Water Retaining Structures
M. R. Kianoush, Lecturer, Department of Civil Engineering, Ryerson Polytechnical Institute, Toronto,
Ontario, Canada, and A. Saneinejad, Structural Engineer, R. V. Anderson, Willowdale, Ontario, Canada

Automatic Design on Partially-Prestressed Composite Members
Yun-Soo Joo, Engineer; Edward M. Frisbee,
Vice President, Engineering; Sam Pizzuto,
Superintendent - Production; and Ted Wolfshal,
Engineer, Stresscon, Inc., Medley, Florida
TECHNICAL SESSION

TUESDAY, March 19
9:00 AM - NOON

Room: Fairfax A

DESIGN OF CONCRETE SHELLS: 1955-1990
A SESSION IN HONOR OF MILO S. KETCHUM

Sponsored by Committee 334

Session Chairman: David P. Billington
Professor
Department of Civil Engineering
and Operations Research
Princeton University
Princeton, New Jersey

Opening Remarks
Anton Tedesco, Consulting Engineer,
Bronxville, New York

Large Barrel Shell Roofs by Ammann & Whitney
Edward Cohen, Managing Partner, Ammann & Whitney,
New York, New York

Thin Shell Roof Designs
Jack Christiansen, Consulting Engineer,
Seattle, Washington

Milo S. Ketchum and the Exploration of Form
David P. Billington, Professor, Department of Civil
Engineering and Operations Research,
Princeton University, Princeton, New Jersey

Response and Discussion
Milo S. Ketchum, Consulting Engineer,
Denver, Colorado

* Theme Session
TECHNICAL SESSION

TUESDAY, March 19
9:00 AM - NOON

Room: Independence East

MATERIALS SCIENCE AND MODELING IN
CONCRETE I: PERMEABILITY AND POROSITY

Sponsored by NSF Center for Science and Technology of Advanced
Cement-Based Materials (ACBM), Concrete Materials Research
Council (CMRC), and Committees 123 and 225

Session Chairman: Lawrence R. Roberts
Director of Technical Services
W. R. Grace & Co.
Cambridge, Massachusetts

Computer Simulation of the Diffusivity of
Cement-Based Materials 9:00
Edward J. Garboczi, Physicist, and Dale P. Bentz,
Chemical Engineer, National Institute of Standards and
Technology, Gaithersburg, Maryland

Moisture Loss and Diffusion by Nonlinear Diffusion Theory 9:20
Jenn-Chuan Chen, Professor and Head, Structural
Division, National Taiwan University, Taipei,
Republic of China

Drying, Permeability, and Durability of
Portland Cement Concrete 9:40
Steven C. Gibbs, Graduate Research Assistant, and
Donald J. Janssen, Assistant Professor, Department of
Civil Engineering, University of Washington,
Seattle, Washington

Characterizing the Water Pore System in Concrete
by Constant Humidity Drying 10:00
Donald Hayward, Graduate Research Assistant, and
Donald J. Janssen, Assistant Professor, Department of
Civil Engineering, University of Washington,
Seattle, Washington

BREAK/OPEN DISCUSSION 10:20

Rapid Determination of the Chloride Diffusivity
of Concrete by Applying an Electric Field 10:40
Tang Luping, Research Assistant, and Lars-Olof
Nilsson, Professor, Division of Building Materials,
Chalmers University of Technology,
Gothenburg, Sweden

continued
MATERIALS SCIENCE AND MODELING IN CONCRETE I: PERMEABILITY AND POROSITY

Sponsored by NSF Center for Science and Technology of Advanced Cement-Based Materials (ACBM), Concrete Materials Research Council (CMRC), and Committees 123 and 225

continued

Development of a Field Permeability Test Apparatus and Method for Concrete
Constantine A. Meletiou, Student; Mang Tia, Associate Professor; and David Bloomquist, Assistant Professor, Department of Civil Engineering, University of Florida, Gainesville, Florida

Mercury Porosimetry of Concrete and Associated Correction Factors
Raymond A. Cook, Graduate Research Assistant, and Kenneth C. Hover, Associate Professor, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York

Experimental and Simulation Studies of the Interfacial Zone in Concrete
Dale P. Bentz, Chemical Engineer; Edward J. Garboczi, Physicist; and Paul Stutzman, Physical Scientist, National Institute of Standards and Technology, Gaithersburg, Maryland
TECHNICAL SESSION

TUESDAY, March 19
9:00 AM - NOON

Room: Independence Center

NEW DEVELOPMENTS IN FIBER REINFORCED CONCRETE FOR THE 21ST CENTURY — PART I

Sponsored by Committees 544 and 549

Session Chairman: Gordon B. Batson
Professor
Department of Civil and Environmental Engineering
Clarkson University
Potsdam, New York

Session Co-Chairman: James I. Daniel
Development Associate
Construction Systems Laboratory
USG Corporation Research Center
Libertyville, Illinois

Introduction 9:00
Gordon B. Batson, Professor, Department of Civil and Environmental Engineering, Clarkson University, Potsdam, New York

Constitutive Modeling of Fiber Reinforced Concrete 9:05
David J. Stevens, Assistant Professor, and Dajin Liu, Graduate Student, Department of Civil and Environmental Engineering, Clarkson University, Potsdam, New York

Shear Behavior of Steel Fiber Reinforced High-Strength Concrete Beams 9:30
S. K. Ghosh, Director of Engineered Structures, Portland Cement Association, Skokie, Illinois; Sung-Woo Shin, Assistant Professor, and Jung-Geun Oh, Graduate Student, Han Yang University, Seoul, Korea

The Response of SIFCON to Blast and Shock Loadings 10:00
Bruce Schneider, Senior Research Engineer, New Mexico Engineering Research Institute, The University of New Mexico, Albuquerque, New Mexico

Shear Capacity of Steel Fiber Reinforced Concrete Based on Plasticity of Concrete 10:30
Gordon B. Batson, Professor, and Alber A. G. Youssef, Former Graduate Student, Department of Civil and Environmental Engineering, Clarkson University, Potsdam, New York

continued
NEW DEVELOPMENTS IN FIBER REINFORCED CONCRETE FOR THE 21ST CENTURY — PART I

Sponsored by Committees 544 and 549

Analytical Deflection Evaluation of Partially Prestressed Fiber Reinforced Concrete Beams 11:00
A. Samer Ezeldin, Assistant Professor, Department of Civil, Environmental and Coastal Engineering, Stevens Institute of Technology, Hoboken, New Jersey

Dynamic Tension Fatigue Performance of Fibrous Concrete Composites 11:30
Norbert L. Lovata, Assistant Professor, and Paul B. Morrill, Research Assistant, Department of Agricultural Engineering, University of Wisconsin-Madison, Madison, Wisconsin
TUESDAY, March 19
9:00 AM - NOON

Room: Commonwealth

SPECIFICATION WORKSHOP

Sponsored by the TAC Specifications Committee

Session Chairman:  Arthur T. Weiss, Jr.
             Certified Construction Specifier
             The Weiss Agency, Inc.
             Denver, Colorado

How Specifications are Incorporated into the Project Manual

Arthur T. Weiss, Jr., Certified Construction Specifier,
The Weiss Agency, Inc., Denver, Colorado

9:00

CSI Modification to ACI Format

Ronald L. Hollrah, Partner, Black & Veatch,
Kansas City, Missouri

9:15

Style, Language and Usage

Thomas B. Dedmon, Jr., Senior Engineer Designer,
El du Pont de Nemours, Newark, Delaware

9:35

Legal Consequences

Jonathan L. Alpert, Partner, Alpert, Josey & Grilli,
Tampa, Florida

9:55

Drafting a Specification, Accumulating Information, Assigning Topics by Part, and CSI Masterformat and Section Format

Arthur T. Weiss, Jr., Certified Construction Specifier,
The Weiss Agency, Inc., Denver, Colorado

10:20

Drafts: Part 1 (General), Part 2 (Products), and Part 3 (Execution)

Arthur T. Weiss, Jr., Certified Construction Specifier,
The Weiss Agency, Inc., Denver, Colorado

11:10

Editing, Final Assembly, and Submittal for the Review Process

Alfred L. Kaufman, Jr., Technical Services Manager,
RMC Lonestar, San Ramon, California

11:40

Review and Question Period

11:55

MENU

Fresh Market Vegetable Soup
Chicken Cacciatore
Rotelli Marinara
Roasted Zucchini, Red Onion and Green Peppers
Garlic Bread
Spumoni
Coffee, Tea, Sanka, Iced Tea
TUESDAY, March 19
2:00 PM - 5:00 PM

FORUM: ARCHITECTURAL CONCRETE CONSTRUCTION

Sponsored by TCRC, CLC, and Committee 303

Session Moderator: Claude B. Trusty, Jr.
Vice President, Technical Services
CBR Cement Corp.
San Mateo, California

Introduction
Claude B. Trusty, Jr., Vice President, Technical Services, CBR Cement Corp., San Mateo, California

High Strength Architectural Concrete
Michel Lessard, Student, and Pierre-Claude Aitcin, Professor, Department of Civil Engineering, University of Sherbrooke, Sherbrooke, Quebec, Canada

Advances in Architectural Forms and Linings
Jerome H. Ford, Sales Manager, Symons Corp., Des Plaines, Illinois

Developments in Consolidation Equipment and Procedures
Allan R. Kenney, President, Precast Systems Consultants, Inc., Venice, Florida

New Materials and Methods for Repair
Alfred D. Perez, Jr., President, Concrete Restoration Service, Inc., Irving, Texas

Sealers, Need, and What is Available
Steven Bratchie, Marketing Manager, Fosroc-Preco Industries, Plainview, New York

Contractors' Day Luncheon
Room: Constitution
Cost: $18.00
Time: NOON - 2:00 PM
Topic: “Up-Down Construction”

Speaker: James Becker, President of The Beacon Corporation and Senior Lecturer in the Department of Civil Engineering and the Center for Real Estate Development at M.I.T.

The Contractors' Day Luncheon is one of the most popular events at ACI conventions — and it's not just for contractors. Don't miss this opportunity to get together with your friends for a fine meal and an interesting talk on the up-down construction method by a nationally-known construction expert.
TUESDAY, March 19
2:00 PM - 5:00 PM

COMPUTER APPLICATIONS IN CONCRETE TECHNOLOGY — PART II

Sponsored by Committee 118

Session Chairman: Thomas H. Wenzel
Associate Professor
Department of Civil Engineering
Marquette University
Milwaukee, Wisconsin

Introduction
Thomas H. Wenzel, Associate Professor, Department of Civil Engineering, Marquette University, Milwaukee, Wisconsin

Lawrence J. Kaetzler, Computer Specialist; James R. Clifton, Group Leader, National Institute of Standards and Technology Building Materials Division, Gaithersburg, Maryland; and Leslie J. Struble, Assistant Professor, University of Illinois, Champaign, Illinois

2:00

COLSHO — Computer Program on Creep and Shrinkage for Concrete Columns
C. Thomas Jan, Structural Engineer, DRC Consultants, Inc., Flushing, New York, and Abdul-lateef M. Al-Khaleefi, Assistant Professor, Kuwait University, Kuwait

2:15

Automatic Design/Detailing of Seismic Resistant R/C Buildings
Michael N. Fardis, Professor, Department of Civil Engineering, University of Patras, Patras, Greece, and A. Harisis, Civil Engineer, Athens, Greece

2:55

Elasto-Plastic Analysis and Design of Concrete Frames
Apostolos Fafitis, Associate Professor, and Hajay Kadam, Graduate Student, Department of Civil Engineering, Arizona State University, Tempe, Arizona

3:20

Computer-Aided Highway Bridge Graphics System
Abraham A. Abougattas, Manager, Highways and Bridges, and Joseph A. Bohinsky, Manager, Civil and Structural Department, Brown & Root, Inc., Houston, Texas

3:45

Construction Load Analysis Using Microcomputers

4:10

56 * Theme Session
COMPUTER-AIDED DESIGN OF CONCRETE SHELLS

Sponsored by Committee 334

Session Chairman: John F. Abel
Professor
School of Civil and Environmental Engineering
Cornell University
Ithaca, New York

Computational Form Finding for Concrete Shell Roofs 2:00
Iain S. Hunter, Project Engineer, T. Y. Lin International,
San Francisco, California, and David P. Billington,
Professor, Department of Civil Engineering,
Princeton University, Princeton, New Jersey

Form Finding of Shells by Methods of Structural Optimization 2:30
Kai-Uwe Bletzinger, Research Assistant, and
Ekkehard Ramm, Professor, Institut fuer Baustatik,
Stuttgart University, Stuttgart, Germany

Computer-Aided Form Generation of Funicular Shells 3:00
G. S. Ramaswamy, Professor, Structural Engineering
Research Center, Madras, India

BREAK 3:30

Computer-Aided Design of Hyperbolic Paraboloid Shells 4:00
Luis Fernando Meyer, Principal, Meyer & Meyer y Asociados, S.A., Asuncion, Paraguay

Design Analysis of CEBAF Experiment Stations 4:30
Atis A. Liepins, Associate, and Frank J. Heger, Senior Principal, Simpson, Gumpertz & Heger, Inc., Arlington, Massachusetts
MATERIALS SCIENCE AND MODELING IN CONCRETE II: OVERVIEW

Sponsored by NSF Center for Science and Technology of Advanced Cement-Based Materials (ACBM), Concrete Materials Research Council (CMRC), and Committees 123 and 225

Session Chairman: Bryce Simons
President
Simons Engineering Services
Seattle, Washington

Models for Mix Optimization of Plastic and Zero Slump Concrete
Per Just Andersen, Industrial Researcher, and Vagn Johansen, Chief Engineer, G. M. Idorn Consult A/S, Birkered, Denmark

Modeling the Size Distribution of Air Voids in Hardened Air-Entrained Concrete
Marcia J. Simon, Research Highway Engineer, Federal Highway Administration, McLean, Virginia; Kumar Natesaiyer, Research Associate, and Kenneth C. Hover, Associate Professor, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York

Axiomatic Models and Their Utilization in Concrete Technology
Sandor Popovics, Professor, Department of Civil and Architectural Engineering, Drexel University, Philadelphia, Pennsylvania

Actual Mean Spacing of Air-Void System in Hardened Concrete
Emmanuel K. Attiogbe, Senior Research Engineer, Master Builders, Inc., Cleveland, Ohio

BREAK/OPEN DISCUSSION

On the Physical Origin of Drying Creep: Another Look Thanks to Silica Fume Concrete
Francois de Larrard, Section Chief, Ministere De L Equipement, Du Logement, Laboratoire Central Des Ponts ET Chaussees, Paris, France

continued
MATERIALS SCIENCE AND MODELING IN CONCRETE II: OVERVIEW

Sponsored by NSF Center for Science and Technology of Advanced Cement-Based Materials (ACBM), Concrete Materials Research Council (CMRC), and Committees 123 and 225

**Filler and Pozzolanic Effects in High-Strength Concretes**  4:00
A. Goldman, Faculty of Civil Engineering, and Amon Bentur, Head, National Building Research Institute, Israel Institute of Technology, Haifa, Israel

**Physical and Chemical Properties Affecting the Durability of OPC and Pozzolanic Cement Concrete**  4:20
Michael N. Fardis, Professor; Vagelis G. Papadakis, Research Assistant; and Costas G. Vayenas, Professor, Department of Civil Engineering, University of Patras, Patras, Greece

**Development and Application of Chemically Differentiated Image Analysis Methods for Portland Cements**  4:40
Sidney Diamond, Professor, School of Civil Engineering, Purdue University, West Lafayette, Indiana

* Theme Session
NEW DEVELOPMENTS IN FIBER REINFORCED CONCRETE FOR THE 21ST CENTURY — PART II

Sponsored by Committees 544 and 549

Session Chairman: Surendra P. Shah
Director
NSF Center for Science and Technology
of Advanced Cement-Based Materials
and Professor
Department of Civil Engineering
Northwestern University
Evanston, Illinois

Session Co-Chairman: James I. Daniel
Development Associate
Construction Systems Laboratory
USG Corporation Research Center
Libertyville, Illinois

Introduction
Surendra P. Shah, Director, NSF Center for Science
and Technology of Advanced Cement-Based Materials,
and Professor, Department of Civil Engineering,
Northwestern University, Evanston, Illinois

The Effect of Low Addition Rates of Polypropylene Fibers on Plastic Shrinkage Cracking and Mechanical Properties
Neal S. Berke, Construction Products Division,
W. R. Grace & Co., Cambridge, Massachusetts

Carbon Fiber Reinforced Cementitious Systems: Some Mechanical and Durability Considerations
Nemkumar Banthia, Assistant Professor, Department of Civil Engineering, Laval University, Ste-Foy, Quebec, Canada

continued
NEW DEVELOPMENTS IN FIBER REINFORCED CONCRETE FOR THE 21ST CENTURY — PART II

Sponsored by Committees 544 and 549


Comparison of Performance of Different Types of Fibers Using the Ring Test
Surendra P. Shah, Director, NSF Center for Science and Technology of Advanced Cement-Based Materials and Professor, Department of Civil Engineering; M. Sarigaphuti, Graduate Student, Department of Civil Engineering, Northwestern University, Evanston, Illinois; and M. Karaguler, Assistant Professor, Department of Civil Engineering, Istanbul Technical University, Istanbul, Turkey

Engineering Properties of Polypropylene Fiber Reinforced Concrete
Ziad Bayasi, Assistant Professor; Fouad Beylouni, Post Doctoral Fellow; and Osama Rabie, Doctoral Candidate, Department of Civil Engineering, San Diego State University, San Diego, California

Durability Characteristics of Wood Fiber Reinforced Cement Composites
Parviz Soroushian, Professor, and Shashidara Marikunte, Graduate Student, Department of Civil and Environmental Engineering, Michigan State University, East Lansing, Michigan
TUESDAY, March 19
2:00 PM - 3:00 PM

LONG-RANGE PLAN/OPEN DISCUSSION

Sponsored by the Planning Committee

Session Chairman: Ignacio Martín
CMA Architects & Engineers
San Juan, Puerto Rico

The ACI Long-Range Plan was approved by the ACI Board of Direction in 1986. Proposed changes to the Long-Range Plan have been developed and will be presented to the Board of Direction during this convention. Before the proposed changes are finalized, we would like your input; so, come join the ACI Planning Committee for an open discussion on the goals and objectives that are being established for ACI.
FORUM: CUTTING EDGE RESEARCH — WHERE IS IT LEADING US?

Sponsored by Committee 123 and CMRC

Session Chairman: Robert L. Henry
Senior Consultant
Bowen Structures
Bedford, Texas

Opening Remarks
Robert L. Henry, Senior Consultant,
Bowen Structures, Bedford, Texas
7:30

Research Needs Survey
G. W. DePuy, Supervisory Materials Research
Engineer, U. S. Bureau of Reclamation, Denver,
Colorado
7:35

Research: Public Works Point of View
Thomas J. Pasko, Jr., Director, Engineering and
Highway Operations Research and Development,
Federal Highway Administration, Annandale, Virginia
7:40

Research: Private Industry Point of View
George C. Hoff, Senior Associate Engineer, Mobile
Research and Development Corp., Dallas, Texas
7:50

Research: Materials Properties Point of View
V. M. Malhotra, Head, Construction Materials Section,
CANMET, Ottawa, Ontario, Canada
8:00

Research: Field Engineering Point of View
Jamie Moreno, Manager, Technical Marketing,
Material Service Corp., Chicago, Illinois
8:10

Research: Contractors’ Point of View
Eugene H. Boeke, Jr., Vice President,
Beers Construction Co., Atlanta, Georgia
8:20

Panel/Floor Open Discussion
8:30

"Put Your Money Where Your Mouth Is"
All Panelists
9:45

* Theme Session
EDUCATIONAL SESSION

WEDNESDAY, March 20
7:00 AM - 8:30 AM

Session Chairman and Speaker Training Breakfast

Sponsored by Committee E903

Session Chairman: Roger E. Wilson
Manager, Education and Training
Portland Cement Association
Skokie, Illinois

Session Moderator: David G. Kittridge
Senior Engineer
Boyle Engineering Corp.
Orlando, Florida

Continental Breakfast for 50 Attendees

Proven Techniques for Lowering the Quality of a Presentation
Kenneth C. Hover, Associate Professor, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York

So, You've Been Asked to Chair a Convention Session? Don't Panic!
Bertold E. Weinberg, Senior Project Manager,
New York Dormitory Authority, Delmar, New York

Evaluation and Adjournment
MEETING TRANSPORTATION AND ENVIRONMENTAL NEEDS FOR THE 21ST CENTURY

Sponsored by the ACI New England Chapter

Session Chairman: Christopher W. Bowker
President
CWB Associates, Inc.
Canton, Massachusetts

Introduction
Christopher W. Bowker, President, CWB Associates, Inc., Canton, Massachusetts

Overview of the Massachusetts Water Resources Authority (MWRA) Plan for the Boston Harbor Clean-Up Project
Jennifer Pinck, Construction Manager, Massachusetts Water Resources Authority, Boston, Massachusetts

Construction of the Two Subaqueous Deepbore Rock Tunnels for the Boston Harbor Clean-Up Project
Larry Williamson, Senior Design Manager, Massachusetts Water Resources Authority, Boston, Massachusetts

Overview: Central Artery/Third Harbor Tunnel Project
Claire Barrett, Director of Public Affairs, Central Artery/Third Harbor Tunnel Project, Department of Public Works, Commonwealth of Massachusetts, Boston, Massachusetts

The Environmental Impact Challenge for the Construction of the Central Artery/Third Harbor Tunnel
Martha Bailey, Manager, Planning and Environment, Department of Public Works, Commonwealth of Massachusetts, Boston, Massachusetts

Engineering Challenges of the Central Artery/Third Harbor Tunnel Project
Robert Albee, Deputy Director, Central Artery/Third Harbor Tunnel Project, Department of Public Works, Commonwealth of Massachusetts, Boston, Massachusetts

Construction Planning for Concrete for the Central Artery/Third Harbor Tunnel Project
Kenneth R. Ware, Manager of Technical Services, Bechtel/Parsons Brinckerhoff, Boston, Massachusetts

* Theme Session
EXPERIMENTAL TECHNIQUES:
TRADITIONAL APPROACHES

Sponsored by Committee 444

Session Chairman: Kirk A. Marchand
Group Leader
Structural Security and Vulnerability
Structural Engineering Department
Southwest Research Institute
San Antonio, Texas

Session Co-Chairman: Gajanan Sabnis
Professor
Department of Civil Engineering
Howard University
Washington, D.C.

Traditional Experimental Techniques: Overview 9:00
Richard N. White, Professor, Department of Civil and
Environmental Engineering, Cornell University, Ithaca,
New York

Structural Response of Bridge Models
Under Simulated AASHTO Loading 9:15
Mohsen A. Issa, Professor, Department of Civil
Engineering, University of Illinois at Chicago, Chicago,
Illinois, and Rajan Sen, Associate Professor,
Department of Civil Engineering and Mechanics,
University of South Florida, Tampa, Florida

Behavior of Horizontal Joints in Precast Concrete
and Block Masonry Construction Under Simulated
Earthquake Loads 9:45
Harry G. Harris, Professor, and Kang-Ho Oh, Graduate
Student, Department of Civil and Architectural
Engineering, Drexel University, Philadelphia,
Pennsylvania

BREAK 10:15

Static Model Studies of Reinforced Concrete
Bridge Decks 10:30
Michael Petrov, Research Assistant, and Philip
Perdkaris, Associate Professor, Department of Civil
Engineering, Case Western Reserve University,
Cleveland, Ohio
EXPERIMENTAL TECHNIQUES:
TRADITIONAL APPROACHES

Sponsored by Committee 444

Experimental Evaluation of Concrete Interface Shear Transfer
Theodor Krauthammer, Professor, and Lucio Palmieri,
Department of Civil Engineering, The Pennsylvania State University, University Park, Pennsylvania

Ph-Techniques for Experimentally Evaluating the Internal Structure of Concrete
Roman Sorokko, Structural Engineer, Sheladia Associates, Inc., New York, New York, and Gajanan Sabnis, Professor, Department of Civil Engineering, Howard University, Washington, D.C.
LUNAR CONCRETE — PART I

Sponsored by Committee 125

Session Chairman: David O. Swint
Professor and Department Head
Department of Civil Engineering
U. S. Air Force Academy
Colorado Springs, Colorado

Session Co-Chairman: Marvin E. Criswell
Professor and Associate Department Head
Department of Civil Engineering
Colorado State University
Fort Collins, Colorado

Synthesis Group's Findings to ACI
Lt. General Sam Armstrong, Director of Programs Architecture, Synthesis Group, Arlington, Virginia

What Every Engineer Should Know About Gravity and Relativity
George D. Nasser, Editor-in-Chief, PCI Journal, Precast-Prestressed Concrete Institute, Chicago, Illinois

Cementitious Material Extraction from Lunar Resources
Shinji Matsumoto, General Manager, The Construction Engineering Department; Tetsuji Yoshida, Manager; and Kenji Takagi, Space Project Office, Shimizu Corp., Tokyo, Japan

Optimizing Lunar Concrete
David O. Swint, Professor and Department Head, Department of Civil Engineering, and Stephen R. Schmidt, Professor and Tenure Head, Department of Mathematical Science, U. S. Air Force Academy, Colorado Springs, Colorado

Long-Term Properties of Mortar Exposed to a Vacuum
Hiroshi Kanamori, Research Engineer, Shinji Matsumoto, Deputy General Manager, and Noboru Ishikawa, Research Engineer, Space Project Office, Shimizu Corp., Tokyo, Japan

Methodology for Forming and Placing Lunar Concretes
Richard A. Kaden, Supervisory Civil Engineer, Department of the Army, Walla Walla District, Corps of Engineers, Walla Walla, Washington

continued
LUNAR CONCRETE — PART I

Sponsored by Committee 125

Lunar Concrete Construction Requires
New Value System and Concepts

Phillip Y. Chow, President, and T. Y. Lin, Honorary Chairman and Founder, T. Y. Lin International, San Francisco, California

An Overview of Engineering Studies in Support of SEI (Space Exploration Initiative) Activities

Philip J. Richter, Chief, Structural Engineer, and Richard M. Drake, Senior Structural Engineer, Fluor Daniel, Inc., Irvine, California; and Ed Repic, Project Manager, Lunar and Planetary Systems, Space Transportation Systems Division, Rockwell International, Downey, California
MATERIALS SCIENCE AND MODELING IN CONCRETE III: MATERIALS AND PROCESSING

Sponsored by NSF Center for Science and Technology of Advanced Cement-Based Materials (ACBM), Concrete Materials Research Council (CMRC), and Committees 123 and 225

Session Chairman: Edward J. Garboczi
Physicist
National Institute of Standards and Technology
Gaithersburg, Maryland

Current Research at the NSF Science and Technology Center for Advanced Cement-Based Materials
Surendra P. Shah, Director, NSF Science and Technology Center for Advanced Cement-Based Materials and Professor, Department of Civil Engineering, Northwestern University, Evanston, Illinois

Simple Hydration Modeling on the Personal Computer
Charles W. Farrell, Graduate Research Assistant, and Kenneth C. Hover, Associate Professor, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York

Modeling Concrete Mixtures
James M. Shilstone, Sr., President, Shilstone & Associates, Inc., Dallas, Texas

The Composition of DSP Cement Pastes
G. K. Sun, Visiting Scholar; P. Lu, Visiting Scholar; and J. Francis Young, Professor, Department of Civil Engineering, University of Illinois at Champaign-Urbana, Urbana, Illinois

BREAK/OPEN DISCUSSION

Performance of DSP Mortars
J. Francis Young, Professor; H. Hsieh, Graduate Student; B. M. Homel, Research Assistant; and T. A. Bier, Research Assistant, Department of Civil Engineering, University of Illinois at Champaign-Urbana, Urbana, Illinois

continued
MATERIALS SCIENCE AND MODELING IN CONCRETE III: MATERIALS AND PROCESSING

Sponsored by NSF Center for Science and Technology of Advanced Cement-Based Materials (ACBM), Concrete Materials Research Council (CMRC), and Committees 123 and 225

Microwave Thermal Processing of Mortars 11:00
M. Moukwa, Research Manager, Master Builders, Inc.; Cleveland, Ohio; S. Christo, Research Engineer, Raytheon Corp., Needham, Massachusetts; M. E. Brodwin, Professor; J. Chang, Graduate Student; and Surendra P. Shah, Director, NSF Science and Technology Center for Advanced Cement-Based Materials and Professor, Department of Civil Engineering, Northwestern University, Evanston, Illinois

Pavement Materials for Vertical Thrust Aircraft 11:20

A Model of the Pore Structure of C-S-H and its Relationship to Creep and Drying Shrinkage 11:40
Hamlin Jennings, Professor, NSF Science and Technology Center for Advanced Cement-Based Materials, Northwestern University, Evanston, Illinois
WEDNESDAY, March 20
9:00 AM - NOON

Room: Independence West

THE EXPANDING WORLD OF SHRINKAGE-COMPENSATING CONCRETE

Sponsored by Committee 223

Session Chairman: Herbert G. Gelhardt III
Civil Engineer
International Admixtures, Inc.
Boca Raton, Florida

Session Co-Chairman: Henry G. Russell
President
Construction Technology Laboratories, Inc.
Skokie, Illinois

Session Moderator: Robert J. Gulyas
Manager
Construction Products and Services
Master Builders Technologies, Inc.
Cleveland, Ohio

Introduction
Herbert G. Gelhardt III, Civil Engineer,
International Admixtures, Inc., Boca Raton, Florida

Manufacturing SCC Since 1969 as a Concrete Producer
Al Kaufman, Chief, Quality Control, RMC Lonestar,
San Ramon, California

Bridge Decks and SCC: Why?
Alan Plain, Engineer, Ohio Turnpike Commission,
Berea, Ohio

Use of SCC on Ohio Turnpike Bridge Decks
Paul W. Gruner, Engineer, Woolpert Consultants,
Dayton, Ohio

Methods of Use of SCC in Specialty Concrete Floors
Pat Harrison, Project Manager, John Rohrer
Construction, Kansas City, Kansas

Looking at Length-to-Width Ratio and Joints in Floor Placing of SCC
Terry Fricks, President, Terry J. Fricks, Inc.,
Ft. Worth, Texas

Strain Gage Testing of SCC Concrete
Edward K. Rice, President, C.T.S.,
Los Angeles, California
WEDNESDAY, March 20
12:45 PM - 1:45 PM

Room: Fairfax A

EFFECTIVE PRESENTATIONS

Sponsored by Committee E903

Session Chairman: George F. Baty
President
Cresset Chemical Co.
Weston, Ohio

Introduction
George F. Baty, President, Cresset Chemical Co.,
Weston, Ohio

12:45

How to Make and Use Technical Slides
Peter McCoy, Technical Sales Representative,
Eastman Kodak Co., Wellesley, Massachusetts

12:55
TECHNICAL SESSION

WEDNESDAY, March 20
2:00 PM - 5:00 PM

Room: Fairfax A

CONCRETE ISSUES FOR THE 21ST CENTURY:
HIGH PERFORMANCE CONCRETE IN
STRUCTURES AND THE ENVIRONMENT

Sponsored by the ACI New England Chapter

Session Chairman:  Kenn Hansen
Admixture Products Specialist
Admixture Division
Master Builders, Inc.
Boston, Massachusetts

High-Strength Concrete: Material of the Future,
Available Today  2:00
Timothy A. Durning, Product Manager for Force 10,000
Microsilica Admixture, W. R. Grace & Co., Cambridge,
Massachusetts

Environmental Solutions for the Concrete Industry  2:30
Gregory C. Guecic, Supervisor, Technical
Advancement Team, Master Builders, Inc.,
Cleveland, Ohio

Plastics for Building and Construction  3:00
William B. Hunt, Marketing Specialist, Building and
Construction, General Electric Co., Pittsfield,
Massachusetts

Cost Effectiveness Using Concrete Construction
in Boston: A Comparison with Structural
Steel Construction  3:30
Hans W. Hagen, Vice President, Le Messuer
Consultants, Inc., Cambridge, Massachusetts

Designing the Egg - Large Digester Tanks with
Prestressed Concrete Doubly Curved Shell Walls  4:00
Frank J. Heger, Senior Principal, Simpson, Gumpertz &
Heger, Inc., Arlington, Massachusetts; Charles S. Hanskat,
Vice President, Engineering, and Jeffrey Ward, Staff
Engineer-Structural, The Crom Corp., Gainesville, Florida

Corrosion Protection for Reinforced Concrete:
The Future is Now  4:30
Terence C. Holland, Director of Marketing
Development, Master Builders, Inc., Cleveland, Ohio
TECHNICAL SESSION

WEDNESDAY, March 20
2:00 PM - 5:00 PM

OPEN PAPER SESSION

Sponsored by TAC

Session Chair: Sharon L. Wood
Assistant Professor
Department of Civil Engineering
University of Illinois at
Urbana-Champaign
Urbana, Illinois

Session Co-Chairman: Steven L. McCabe
Assistant Professor
Department of Civil Engineering
University of Kansas
Lawrence, Kansas

Driving Long Precast Prestressed Concrete Piles
Mohamed H. Hussein, Manager and Senior Engineer,
Goble Rausche Likins and Associates, Inc.,
Orlando, Florida

Assessment of Creep and Shrinkage in
High-Strength Concrete Columns
C. Thomas Jan, Structural Engineer, Weidlinger
Associates, New York, New York

Static and Dynamic Friction Tests in Concrete Elements
Juan J. Bariola, Professor, Department of Structural
Engineering, Universidad Catolica del Peru, Lima, Peru;
Luis E. Garcia, Professor, Department of Civil
Engineering, Universidad de Los Andes, Bogota,
Colombia; and Mete A. Sozen, Professor, Department
of Civil Engineering, University of Illinois at
Urbana-Champaign, Urbana, Illinois

Maurice J. Tobin Memorial Bridge Concrete Rehabilitation
Gerard J. Grippo, Project Engineer, and Gary A.
Klevens, Project Engineer, A. G. Lichtenstein &
Associates, Inc., Framingham, Massachusetts

Effects of Composite Action Between Portland Cement
Concrete and Polyester-Styrene Polymer Concrete
Daniel O'Connor, Graduate Student, and M. Salidi,
Professor, Department of Civil Engineering,
University of Nevada-Reno, Reno, Nevada

Bond of Epoxy-Coated Reinforcement
Under Repeated Loading
D. B. Cleary, Graduate Research Assistant, and Julio
Ramirez, Associate Professor, School of Civil
Engineering, Purdue University, West Lafayette, Indiana

Earthquake Cracking in Concrete Masonry “Shearwalls”
Brian Kehoe, Senior Engineer, Wiss, Janney, Elstner
Associates, Inc., Emeryville, California
TECHNICAL SESSION

WEDNESDAY, March 20
2:00 PM - 5:00 PM

LUNAR CONCRETE — PART II

Sponsored by Committee 125

Session Chairman: Richard A. Kaden
Supervisory Civil Engineer
Department of the Army
Walla Walla District
Corps of Engineers
Walla Walla, Washington

Session Co-Chairman: Philip J. Richter
Chief, Structural Engineer
Fluor Daniel, Inc.
Irvine, California

Introduction 2:00
Richard A. Kaden, Supervisory Civil Engineer,
Department of the Army, Walla Walla District,
Corps of Engineers, Walla Walla, Washington

Stresses in Concrete Panels Exposed to
the Sun on the Moon 2:05
T. D. Lin, Principal Research Engineer, and Gamal
Ahmed, Researcher, Construction Technology
Laboratories, Inc., Skokie, Illinois; Glen Hill, Former
Cadet; Stacey Robinson, Former Cadet; and Charles
Lindbergh, Department Head, Department of Civil
Engineering and Computer Science, The Citadel
College, Charleston, South Carolina; Timothy Lin,
Graduate Student, Department of Ceramic Engineering,
University of Missouri, Rolla, Missouri; and Joseph J.
O’Gallagher, Professor, Department of Physics,
University of Chicago, Chicago, Illinois

The Role of CETEC (Center for Extraterrestrial
Engineering and Construction) in the Development
of Lunar Concrete 2:25
Peter A. Hart, Research Analyst, and Gerald G. Leigh,
Senior Technical Advisor, New Mexico Engineering
Research Institute, University of New Mexico,
Albuquerque, New Mexico; Steven D. Howe, Los
Alamos National Laboratory, Los Alamos, New Mexico;
Stewart W. Johnson, Principal Engineer, BDM
International, Inc., Albuquerque, New Mexico; and
Raymond S. Leonard, President, Ad Astra, Ltd.,
Santa Fe, New Mexico

continued
LUNAR CONCRETE — PART II

Sponsored by Committee 125

Astronomical Observations on the Lunar Surface: A New Challenge for Civil Engineers 2:45
Paul N. Swanson, Astrophysics Program Manager; James D. Burke, Technical Staff; James A. Cutts, Manager, Science Instruments; and James A. Hendrickson, Applied Mechanics Technology Section, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California

Concrete Reinforced with GFRP (Glass-Filament-Reinforced-Plastic) in lieu of Conventional Steel 3:05
S. Paul Bunéa, Professor, Fairleigh Dickinson University, Teaneck, New Jersey

Environmental Effects on Lunar Observations and Lunar Concrete 3:25
Stewart W. Johnson, Principal Engineer, and John P. Wetzel, Associate Staff Member, BDM International, Inc., Albuquerque, New Mexico; G. Jeffrey Taylor, Professor, Planetary Geosciences Division, University of Hawaii, Honolulu, Hawaii; and Jack O. Burns, Professor and Head, Department of Astronomy, New Mexico State University, Las Cruces, New Mexico

Production of Lunar Concrete in Large Pressurized Assembly Facilities 3:45
Richard M. Drake, Senior Structural Engineer, Fluor Daniel, Inc., Irvine, California

Educational Program in Space Civil Engineering 4:05
Marvin E. Criswell, Professor and Associate Department Head, and Willy Z. Sadeh, Professor, Department of Civil Engineering, Colorado State University, Fort Collins, Colorado

A Novel Solar Concentrator for Very High Temperature Processing of Lunar Cement 4:30
Joseph J. O’Gallagher, Professor, Department of Physics, University of Chicago, Chicago, Illinois, and T. D. Lin, Principal Research Engineer, Construction Technology Laboratories, Inc., Skokie, Illinois

* Theme Session
MATERIALS SCIENCE AND MODELING IN
CONCRETE IV: STRENGTH AND FRACTURE
MECHANICS

Sponsored by NSF Center for Science and Technology of Advanced
Cement-Based Materials (ACBM), Concrete Materials Research
Council (CMRC), and Committees 123 and 225

Session Chairman: Kenneth C. Hover
Associate Professor
School of Civil and
Environmental Engineering
Cornell University
Ithaca, New York

Why a Committee on Mathematical Modeling?  2:00
Kenneth C. Hover, Associate Professor, School of Civil
and Environmental Engineering, Cornell University,
Ithaca, New York

Prediction of Concrete Strength  2:20
Ken W. Day, Director, Concrete Advice Pty., Ltd.,
Victoria, Australia

Fracture Characteristics of Deteriorated Concrete  2:40
Jonathan Wood, Director, Special Services Division,
and T. M. Chrisp, Engineer, Mott MacDonald Group,
Croydon, England

Strain Field Measurement with Laser Holography
and Image Analysis  3:00
A. Castro-Montero, Graduate Student, and Surendra P.
Shah, Director, NSF Science and Technology Center
for Advanced Cement-Based Materials and Professor,
Department of Civil Engineering, Northwestern
University, Evanston, Illinois

BREAK/OPEN DISCUSSION  3:20

Applications of a Novel Cementitious Composites
Axial Tensile Tester  3:40
Tahar El-Korchi, Assistant Professor; Houssam
Toutanji, Graduate Student; Robert N. Katz, Associate
Professor; and Gary L. Leatherman, Assistant
Professor, Worcester Polytechnic Institute, Worcester,
Massachusetts

continued
MATERIALS SCIENCE AND MODELING IN CONCRETE IV: STRENGTH AND FRACTURE MECHANICS

Sponsored by NSF Center for Science and Technology of Advanced Cement-Based Materials (ACBM), Concrete Materials Research Council (CMRC), and Committees 123 and 225

continued

Contribution of Bond-Slip to Pull-Out Energy and Toughness on FRC Composites 4:00
Antoine E. Naaman, Professor, and J. Alwan, Graduate Student, Department of Civil Engineering, The University of Michigan, Ann Arbor, Michigan

Effect of Loading Rate and Temperature on Fracture of Concrete 4:20
Zdeněk P. Bažant, Professor; R. Gettu, Graduate Student; and S. Beissel, Graduate Student, Department of Civil Engineering, Northwestern University, Evanston, Illinois

Interaction Between Fibers and Cement-Based Matrices 4:40
Surendra P. Shah, Director, NSF Science and Technology Center for Advanced Cement-Based Materials and Professor, Department of Civil Engineering, Northwestern University, Evanston, Illinois, and Barzin Mobasher, Research Engineer, USG Corp., Libertyville, Illinois
TECHNICAL SESSION

WEDNESDAY, March 20
2:00 PM - 5:00 PM

Room: Independence Center

EXPERIMENTAL TECHNIQUES:
NDE APPROACHES

Sponsored by Committee 444

Session Chairman: Kirk A. Marchand
Group Leader
Structural Security and Vulnerability
Structural Engineering Department
Southwest Research Institute
San Antonio, Texas

Session Co-Chairman: Theodor Krauthammer
Professor
Department of Civil Engineering
The Pennsylvania State University
University Park, Pennsylvania

NDE Experimental Techniques — An Overview 2:00
Bernard R. Tittmann, Professor, Department of
Engineering Science and Mechanics, The Pennsylvania
State University, University Park, Pennsylvania

Characterization of the Electromagnetic
Properties of Concrete 2:15
Udaya B. Halabe, Assistant Professor, Department of
Civil Engineering, University of West Virginia,
Morgantown, West Virginia; Kenneth R. Maser,
President, and Arash Sotodehnia, Project Engineer,
INFRASENSE Inc., Cambridge, Massachusetts

Detection of Deterioration in Asphalt Overlaid Reinforced
Concrete Bridge Decks Using Ground Penetrating Radar 2:45
Kenneth R. Maser, President, INFRASENSE Inc.,
Cambridge, Massachusetts

BREAK 3:15

ND Field Vacuum Test for Concrete Leak Tightness 3:30
Morris Schupack, Partner, and Daniel Schupack,
Engineer, Schupack Suarez Engineers, Inc.,
Norwalk, Connecticut

Improved Method for Nondestructive Testing
of Concrete Prisms 4:00
Stephen L. Clarke, Graduate Student; W. D. Scott,
Professor of Materials; D. J. Janssen, Professor,
Department of Civil Engineering; and J. D. Chalupnik,
Professor, Department of Mechanical Engineering,
University of Washington, Seattle, Washington

Optical Fiber Applications for Concrete Testing 4:30
Peter L. Fuhr; Dryver R. Huston; Jean-Guy Béliveau;
and Darrell M. Snyder, College of Engineering and
Mathematics, University of Vermont, Burlington, Vermont
AWARDS BREAKFAST

THURSDAY, March 21
8:00 AM - 10:00 AM

Room: Grand Ballroom

Cost: $14.00

AWARDS BREAKFAST

Come meet the awardees. Enjoy a good breakfast and the awards presentation. Please purchase tickets by Tuesday at 5:00 PM.

AWARDS

Honorary Membership
Charles J. Pankow
Bengt F. Friberg

Arthur R. Anderson Award
Thomas T. C. Hsu

Roger H. Corbetta Concrete Constructor Award
Sam Kurtz

Joe W. Kelly Award
Alan H. Mattock

Henry L. Kennedy Award
William R. Tolley

Alfred E. Lindau Award
Edward S. Hoffman

Henry C. Turner Medal
Daniel P. Jenny

Wason Medal for Materials Research
Mary J. Sansalone
Nicholas J. Carino

Wason Medal for Most Meritorious Paper
Shrinivas B. Bhide
Michael P. Collins

Construction Practice Award
Terence C. Holland

Structural Research Award
Neil M. Hawkins
Albin Bao
Jun Yamazaki

continued
Maurice P. van Buren Structural Engineering Award
Bill L. Gunnin

Chapter Activities Award
James S. Lai

Delmar L. Bloem Award for Distinguished Service
Bryant Mather
James K. Wight

Fellows

Chapter Awards — Citations of Excellence

Certificates of Membership Appreciation
Cement & Concrete Association (Australia)
Charles W. Wilson

Reinforced Concrete Research Council
Arthur J. Boase Award
Daniel P. Jenny

Portland Cement Association
Concrete Bridge Awards
Albemarie Sound Bridge - North Carolina
Bennett Bay Centennial Bridge - Idaho
Dame Point Bridge - Florida
Routes 15 and 91 Interchange - California
Sacramento River Trail Pedestrian Bridge - California
Trustin Ranch Golf Club Entry Bridge - California
GENERAL SESSION

THURSDAY, March 21
10:00 AM
Room: Ballroom A
Hynes Convention Center

GENERAL SESSION

Session Chairman: Kenneth B. Rear
Manager, Technical Services
W. R. Grace & Co.
Cambridge, Massachusetts

Welcome to Boston
Kenneth B. Rear, Manager, Technical Services,
W. R. Grace & Co., Cambridge, Massachusetts

Certificates of Appreciation for the 1991 Spring Convention

Recognition of International Visitors

Recognition of Chapter Officers Present

Recognition of Past Presidents Present

Recognition of Retiring Board of Direction, Technical Activities Committee, and Educational Activities Committee Members

Presidential Address:
"ACI in a Changing World"
John M. Hanson, President, Wiss, Janney, Elstner Associates, Inc.,
Northbrook, Illinois

Tellers Report

Presentation of Memento to Retiring President

Keynote Address:

"Challenges Facing American Business: The Savings & Loan Crisis"

As Chairman of the Senate Banking Committee, Senator William Proxmire
earned a reputation as one of the top economic minds in Congress. His Golden
Fleece Awards were the first to expose waste in government spending. His address
will focus on the savings and loan crisis and other issues facing the business world in
America and the outlook for members of the concrete and construction industry.

Closing Remarks
THURSDAY, March 21
Hynes Convention Center

To begin 5-10 minutes after the General Session

STANDARDS PRESENTATION

Session Chairman: I. Leon Glassgold
President
Masonry Resurfacing & Construction Co., Inc.
Baltimore, Maryland

Proposed ACI Standards:

Standard Practice for Selecting Proportions for Structural Lightweight Concrete (ACI 211.2)
— Proposed Revision of ACI 211.2-81 (Reapproved 1990)
* Presented by David A. Crocker, Chairman, 211-B

Standard Practice for Design and Construction of Concrete Silos and Stacking Tubes for Storing Granular Materials (ACI 313)
— Proposed Revision of ACI 313-77 (Revised 1983)
* Presented by John E. Sadler, Chairman, 313
THURSDAY, March 21
2:00 PM - 4:00 PM

FRACTURE MECHANICS OF DAMS

Sponsored by Committee 446

Session Chairman: Zdeněk P. Bažant
   Professor
   Department of Civil Engineering
   Northwestern University
   Evanston, Illinois

Session Co-Chairman: Victor E. Saouma
   Assistant Professor
   Department of Civil and
   Environmental Engineering
   University of Colorado at Boulder
   Boulder, Colorado

Is No Tension Design of Dams Safe According to Fracture Mechanics? 2:00
   Zdeněk P. Bažant, Professor, and G. Gioia, Graduate Student, Department of Civil Engineering, Northwestern University, Evanston, Illinois

Finite Element Analysis of an Arch Dam on Fractured Rock 2:20
   A. Gens, Professor, Geotechnical Department, University of Catalunya, Barcelona, Spain

Fracture Mechanics Analysis of Lock and Dam 27 2:40
   R. Reich, Graduate Research Assistant, and Victor E. Saouma, Assistant Professor, Department of Civil and Environmental Engineering, University of Colorado at Boulder, Boulder, Colorado; and J. Jaeger, Chief Structural Engineer, U. S. Army Corps of Engineers, Jacksonville District, Jacksonville, Florida

Fracture Behavior of Aggregate Mortar Interfaces 3:00
   Oral Buyukozturk, Professor, and Kwang M. Lee, Graduate Research Assistant, Department of Civil Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts

The Importance of Mode II Fracture in Concrete Gravity Dams 3:20
   Y. R. Rashid, President; P. R. Barrett, Senior Engineer; and R. J. James, Manager of Structural Methods, ANATECH Research Corp., La Jolla, California

★ Theme Session 85
TECHNICAL SESSION

THURSDAY, March 21
2:00 PM - 5:00 PM

Room: Fairfax A

DETECTION OF CHLORIDE-INDUCED CORROSION AND RELATED DETERIORATION

Sponsored by Committee 222

Session Chairman: Brian B. Hope
Professor
Department of Civil Engineering
Queen's University
Kingston, Ontario, Canada

Introduction
Brian B. Hope, Professor, Department of Civil Engineering, Queen's University, Kingston, Ontario, Canada

Electrochemical Corrosion Rate Meter for On-Site Measurement of Concrete Structures
Carmen Andrade, Research Professor; S. Fellu, Research Professor; J. A. Gonzalez, Research Professor; C. Alonso, Researcher; and M. Garcia, Research Assistant, CSIC, Madrid, Spain

Long-Term Corrosion Performance of Concrete Produced with Microsilica and Calcium Nitrite
Neal S. Berke, Research Manager, and Thomas G. Weil, Group Product Manager, W. R. Grace & Co., Cambridge, Massachusetts

Predicting Time to Maintenance Using the Three Electrode Polarization Technique

Developments in Inspection Techniques for Reinforced and Prestressed Concrete Structures
D. Gareth John, Coordinator; K. Hladky, Senior Project Officer; P. A. Gaydecki, Project Officer; and M. A. Jafar, Project Officer, CAPCIS Ltd., Manchester, England

continued
DETECTION OF CHLORIDE-INDUCED CORROSION AND RELATED DETERIORATION

Sponsored by Committee 222

Corrosion Rate Measurements in Reinforced Concrete Structures
Kurt M. Lawson, Staff Engineer, and Neil G. Thompson, President, C. C. Technologies, Columbus, Ohio
3:45

Operational Experience Using Radar and Thermography for Bridge Deck Condition Surveys
David G. Manning, Head, Materials Research, and Tony Masliwec, Research Scientist, Ontario Ministry of Transportation, Downsview, Ontario, Canada
4:10

Methods for Detecting Corrosive Environments and Active Corrosion of Prestressing Steel
V. Novokshchenov, Consultant, Concrete Clinic International, Inc., Gibsonia, Pennsylvania
4:35
TECHNICAL SESSION

THURSDAY, March 21  Room: Independence West
2:00 PM - 5:00 PM

FIRE RESISTANCE OF MATERIALS
AND/OR MEMBERS MADE WITH
HIGH-STRENGTH CONCRETE

Sponsored by Committee 216

Session Chairman:  William L. Gamble
Professor
Department of Civil Engineering
University of Illinois at
Urbana-Champaign
Urbana, Illinois

Session Co-Chairman:  U. Diedrichs
Professor
Institüt für Baustoffe
Massivbau und Brandschutz
Technical University of Braunschweig
Braunschweig, Germany

Danish Investigations on Silica Fume Concretes
at Elevated Temperatures  2:00
Kristian Hertz, Professor, Institute of Building Design,
Technical University of Denmark, Lyngby, Denmark

Behavior of High-Strength Concrete at
Elevated Temperatures  2:25
Ahmad J. Durrani, Professor, Department of Civil
Engineering, Rice University, Houston, Texas

Mechanical High Temperature Properties and
Spalling Behavior of High-Strength Concrete  2:50
U. M. Jumppanen, Professor, Fire Technology
Laboratory, Technical Research Center of Finland,
Espoo, Finland, and U. Diedrichs, Professor, Institut für
Baustoffe, Massivbau und Brandschutz, Technical
University of Braunschweig, Braunschweig, Germany

Spalling of High-Strength Lightweight Aggregate
Concrete Under Intense Hydrocarbon Fire Exposure  3:15
Michael P. Gillen, Senior Research Engineer,
Production Research and Development Division,
Conoco, Inc., Ponca City, Oklahoma; Bernd Kepp,
Senior Structural Engineer, and Malvin Sandvik,
Manager, Concrete Technology and Materials Research
and Development, Norwegian Contractors, Stabekk,
Norway

continued
THURSDAY, March 21
2:00 PM - 5:00 PM

FIRE RESISTANCE OF MATERIALS
AND/OR MEMBERS MADE WITH
HIGH-STRENGTH CONCRETE

Sponsored by Committee 216

Effect of High-Strength Concrete on Structural
Fire Design According to Finnish Tests 3:40
Timo Inha, Division of Structural Engineering, Tampere
University of Technology, Tampere, Finland

Fire Tests on High-Strength Concrete Elements 4:05
T. T. Lie, Principal Research Officer, Institute for
Research in Construction, National Research Council,
Ottawa, Ontario, Canada

Spalling of High-Strength Concrete in Fire 4:30
G. Sanjayan, Professor, and L. Stocks, Graduate
Student, Department of Civil Engineering, Monash
University, Clayton, Victoria, Australia
TECHNICAL SESSION

THURSDAY, March 21
2:00 PM - 5:00 PM
Room: Independence Center

CONNECTIONS BETWEEN PRECAST CONCRETE ELEMENTS

Sponsored by Committees 352 and 550

Session Chairman: James K. Wight
Professor
Department of Civil Engineering
The University of Michigan
Ann Arbor, Michigan

Session Co-Chairman: M. Nadim Hassoun
Professor
Department of Civil Engineering
South Dakota State University
Brookings, South Dakota

Moment Resisting Connections Between Precast Elements
2:00
Catherine French, Associate Professor, Department of Civil and Mineral Engineering, University of Minnesota, Minneapolis, Minnesota

Lateral Load Behavior of Large Panel Precast Connections
2:30
Luis Garcia, Structural Engineer, Proyectos y Disenos Ltda., Bogota, Columbia, and Mete Sozen, Professor, Department of Civil Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois

Design and Construction Features of a 37-Story Precast Reinforced Concrete Frame Building in Tokyo
3:00
Cloyd E. Warnes, Principal, CPM Associates, Consulting Engineers, Sacramento, California

Development of Design Procedures for Precast Concrete Connections
3:30

Seismic Design of Precast Concrete Shearwall Buildings Using Explicit Yielding of Connections
4:00
Gene R. Stevens, Senior Project Manager, Simpson, Gumpertz & Heger, Inc., Arlington, Massachusetts

The Design and Detailing of Connections in Precast Parking Structures that Allow for Volume Change Forces and Strains
4:30
Thomas J. D'Arcey, President, CEG-Texas, The Consulting Engineers Group, Inc., San Antonio, Texas
TECHNICAL SESSION

THURSDAY, March 21
2:00 PM - 5:30 PM

Room: Commonwealth

SHOTCRETE IN THE 21ST CENTURY

Sponsored by Committee 506

Session Chairman: Dudley R. Morgan
Chief Materials Engineer
Hardy BBT Limited
Burnaby, British Columbia, Canada

Session Co-Chairman: Steven H. Gebler
Principal Evaluation Engineer
Construction Technology Laboratories, Inc.
Skokie, Illinois

Current and Future Uses of the Shotcrete Process 2:00
Larry Totten, Vice President, Johnson Western Gunite Co., San Leandro, California

A Review of the Construction and Reconstruction of a Major Architectural Concrete Structure Using Shotcrete 2:30
William L. Snow, Sr., President, Palmetto Gunite Construction Co., Ravenel, South Carolina

Durability of Dry-Mix Shotcrete Containing Rapid Set Accelerators 3:00

High-Early-Strength-Blended Cement Wet Mix Shotcrete 3:30
Dudley R. Morgan, Chief Materials Engineer, Hardy BBT Limited, Burnaby, British Columbia, Canada

High-Early-Strength-Shotcrete for Expedient Repair of Bomb-Damaged Structures 4:00

Advances in Dry Shotcrete Technology by Means of Microsilica 4:30
Terje Nilsen, and Per Fidjestol, Manager, Concrete Technical Services, Elkem Materials, Kristiansand, Norway

The Use of Shotcrete to Repair Structures in a Post-Attack Environment 5:00

* Theme Session
PERSONAL LOG
1991 SPRING CONVENTION

Delegate's Name

Sunday, March 17, 1991  HAPPY ST. PATRICK'S DAY!

2:00 PM  Session: Innovative Rehabilitation
          Independence Center
5:00 PM  Technology for the 21st Century

5:30 PM  Opening Reception  Grand Ballroom

Monday, March 18, 1991

7:00 AM

8:30 AM

8:30 AM

10:00 AM

9:00 AM - NOON  Sessions:
                   The Importance of Flow
                   Independence East
                   Properties and Flow Patterns in Silo Design
                   Independence West
                   Concrete and Grouts in Nuclear and Hazardous Waste Disposal - Part I
                   Independence Center
                   Architectural Precast Concrete Design Considerations
                   Fairfax A
                   New Developments in Concrete Pavements - Part I

10:00 AM

11:30 AM

11:30 AM

1:00 PM

1:00 PM

2:00 PM

2:00 PM

3:30 PM

2:00 PM - 5:00 PM  Session: The 3 R's: Repair, Restoration and Rehabilitation
                   Commonwealth
                   Concrete and Grouts in Nuclear and Hazardous Waste Disposal - Part II
                   Independence West
                   New Developments in Concrete Pavements - Part II
                   Fairfax A
                   Research in Progress  Independence Center

92  Theme Session: Concrete in the 21st Century  Hot Topic
Monday, March 18, 1991

3:30 PM -
5:00 PM  
6:30 PM

Tuesday, March 19, 1991

7:00 AM -
8:30 AM  
8:30 AM -
10:00 AM

9:00 AM - NOON Sessions: Independence West

★ Computer Applications in Concrete Technology - Part I

★ Design of Concrete Shells: 1955-1990 Fairfax A

★ Materials Science and Modeling Independence East in Concrete I: Permeability and Porosity

★ New Developments in Fiber Reinforced Concrete for the 21st Century - Part I

Specification Workshop Commonwealth

10:00 AM -
11:30 AM  
NOON-2:00 PM

2:00 PM -
3:30 PM

2:00 PM -
3:00 PM Open Discussion: Republic A

Sessions/Forum: Commonwealth

2:00 PM -
5:00 PM

Forum: Architectural Concrete Construction

★ Computer Applications in Concrete Technology - Part II Independence West

Computer-Aided Design of Concrete Shells Fairfax A

★ Materials Science and Modeling Independence East in Concrete II: Overview

★ New Developments in Fiber Reinforced Concrete for the 21st Century - Part II Independence Center

3:30 PM -
5:00 PM

* Theme Session: Concrete in the 21st Century
Tuesday, March 19, 1991

5:00 PM - 6:30 PM

7:30 PM - 10:00 PM Forum: Cutting Edge Research - Where is it Leading Us? Commonwealth

Wednesday, March 20, 1991

7:00 AM - Educational Breakfast: Republic A
Session Chairman and
Speaker Training Breakfast

7:00 AM - 8:30 AM

8:30 AM - 10:00 AM

9:00 AM - NOON Sessions: Fairfax A
Meeting Transportation and
Environmental Needs for the 21st Century

Experimental Techniques:
Fairfax A
Traditional Approaches

Independence Center

Commonwealth

Fairfax A

Lunar Concrete - Part I

Independence East

The Expanding World of
Shrinkage-Compensating Concrete

Independence West

10:00 AM - 11:30 AM

11:30 AM - 1:00 PM

12:45 PM - Seminar: Fairfax A
1:45 PM Effective Presentations

1:00 PM - 2:00 PM

2:00 PM - 3:30 PM

2:00 PM - 5:00 PM Sessions: Fairfax A
Concrete Issues for the 21st Century:
High Performance Concrete in Structures and the Environment:

Open Paper Session Independence West

Commonwealth

Independence East

Independence Center

Experimental Techniques:
NDE Approaches

3:30 PM - 5:00 PM
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**Thursday, March 21, 1991**

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<td>Awards Breakfast</td>
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<td>General Session and Standards Presentation</td>
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<td>Session: Fracture Mechanics of Dams</td>
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<td>2:00 PM</td>
<td>Sessions: Detection of Chloride-Induced</td>
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<td>Corrosion and Related Degeneration</td>
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<td>Connections Between Precast Concrete Elements</td>
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<td>2:00 PM</td>
<td>Session: Shotcrete in the 21st Century</td>
<td>Commonwealth</td>
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* Theme Session: Concrete in the 21st Century
Admixtures
• Chemical Admixtures for Concrete .................................................. 212.3R-89
• How to Effectively Use the Newest Admixtures .......... SCM 23-90

Bridges
• Esthetics in Concrete Bridge Design ................................................. MP-1
• External Prestressing in Bridges ..................................................... SP-120

Cold Weather
• Standard Specification for Cold Weather Concreting .................. 306.1-90

Concrete Performance
• Paul Klieger Symposium on Performance of Concrete ... SP-122

Concrete Practice
• Manual of Concrete Practice ...................................................... 1991 MCP 5 Part Set

Construction
• Troubleshooting Concrete Construction ....................... SCM 22-90

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