

AMERICAN CONCRETE INSTITUTE

*“Concrete
in the
21st Century”*



1991 Spring Convention

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



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CITY OF BOSTON • MASSACHUSETTS

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

BOSTON CITY HALL • ONE CITY HALL PLAZA
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Telephone: (313) 532-2600

american concrete institute

BOX 19150
DETROIT, MICHIGAN 48219-0150



March 1991

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

progress through knowledge

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

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Concrete in the 21st Century

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CONVENTION SPONSORS

DIAMOND

ACI New England Chapter
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PLATINUM

Conchem
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Blue Circle Cement, Inc.
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ACI Delaware Valley Chapter
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ACI Northern California & Western Nevada Chapter
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CONVENTION SPONSORS

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P. J. Keating Co.
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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

**ACI NEW ENGLAND CHAPTER
CONVENTION COMMITTEE**

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continued

**ACI NEW ENGLAND CHAPTER
CONVENTION COMMITTEE**

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
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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 STANDARDS PRESENTATION

Hynes Convention Center

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

Monday, March 18 318 Steering Committee Breakfast
7:00 AM - 8:30 AM Berkeley A

Tuesday, March 19 Educators Roundtable Breakfast
7:00 AM - 8:30 AM Republic B
ALL EDUCATORS ARE INVITED!!!

Committee Chairman Training Breakfast
Constitution

Thursday, March 21 Seminar Planning Lunch
NOON - 2:00 PM Gardner A

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 your tickets in advance
at the ACI Spouse/Guest Registration Desk. See pages
15-16 for further details.

GENERAL INFORMATION

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

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.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

Grand Ballroom

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

Grand Ballroom

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

Ballroom A

General Session

Hynes Convention Center

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 26), 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

1991 International Congress on Polymers in Concrete — North American Workshop. September 25 - 27, 1991, San Francisco, California, U.S.A.

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**

WHERE'S THAT MEETING ROOM?

SHERATON BOSTON HOTEL & TOWERS

Room	Level	Floor
Apley's	Plaza	2nd
Beacon A, B, C, D, E, F, G, H	Conference	3rd
Berkeley, A, B	Conference	3rd
Board Room	Conference	3rd
Clarendon A, B	Conference	3rd
Commonwealth	Conference	3rd
Conference	Conference	3rd
Constitution	Plaza	2nd
Dalton A, B	Conference	3rd
Exeter A, B	Conference	3rd
Fairfax A, B	Conference	3rd
Gardner A, B	Conference	3rd
Grand Ballroom	Plaza	2nd
Hampton A, B	Conference	3rd
Hynes Ballroom	Hynes Convention Center	3rd
Independence East	Plaza	2nd
Independence Center	Plaza	2nd
Independence West	Plaza	2nd
Jefferson	Conference	3rd
Kent	Conference	3rd
Liberty A, B, C, D, E, F, G	Plaza	2nd
Republic A, B	Plaza	2nd

DAILY EVENTS

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

SATURDAY / SUNDAY

Day/Time Function Room

SATURDAY, MARCH 16, 1991

8:30 AM-6:00 PM

TAC Technical Activities Committee (Mtg. 1) Gardner A/B

SUNDAY, MARCH 17, 1991

8:30 AM-11:00 AM

344 Circular Prestressed Conc. Structures (Mtg. 1) Liberty C

8:30 AM-6:00 PM

TAC Review Group 1 Gardner A/B

TAC Review Group 2 Dalton B

TAC Review Group 3 Clarendon A

TAC Review Group 4 Clarendon B

9:00 AM-5:00 PM

EAC Educational Activities Committee (Mtg. 1) Exeter A/B

10:00 AM-1:00 PM

CLC Construction Liaison Liberty E

341 Earthquake Resistant Concrete Bridges Beacon B

1:00 PM-4:00 PM

343 Concrete Bridge Design Beacon C

1:00 PM-5:30 PM

355 Anchorage to Concrete Fairfax B

2:00 PM-3:30 PM

Hot Topic Subcommittee Liberty A

TCRC Construction Review Liberty C

2:00 PM-5:00 PM TECHNICAL SESSION:

★ Innovative Rehabilitation Independence Center
Technology for the 21st Century

2:00 PM-5:00 PM

352 Joints and Connections in Beacon B
Monolithic R/C Structures

408 Bond and Development of Reinforcement Republic A
Ad Hoc Committee on Short Duration Jefferson
Dynamic & Vibratory Load Effects

3:30 PM-5:00 PM

E902 Certification (Mtg. 1) Liberty E

120 History of Concrete Liberty C

318.1- Building Code Requirements for Dalton A

TGP Structural Plain Concrete

4:00 PM-5:30 PM

343/348 Task Committee on LRFD Beacon C

348/343 Task Committee on LRFD Beacon C

SUNDAY / MONDAY

Day / Time Function Room

SUNDAY, MARCH 17, 1991

5:30 PM-7:00 PM

Opening Reception Grand Ballroom
 (Sponsored by the ACI New England Chapter)

7:00 PM-8:30 PM

313 Concrete Bins & Silos (Mtg. 1) Republic A

7:00 PM-10:00 PM

447 Finite Element Analysis of Jefferson
 Reinforced Concrete Structures

MONDAY, MARCH 18, 1991

8:00 AM-1:00 PM

TAC Technical Activities Committee (Mtg. 2) Gardner A/B

8:30 AM-10:00 AM

E705 Educational Computer Activities Board
 126.2 Aggregates Beacon E
 213-A High-Strength Lightweight Concrete Hampton A
 361 Pressure Vessels Berkeley B
 544-A Steel Fibers Fairfax B
 544-B Glass Fibers Beacon F

8:30 AM-11:30 AM

E801 Student Concrete Projects Kent
 E902C-2 Inspector II Clarendon B
 212 Chemical Admixtures Jefferson
 332 Residential Concrete Hampton B
 336 Footings Liberty D
 351-3 Static Equipment Foundations Dalton A
 368 Earthquake Resistance Members/Systems Beacon B
 515 Coatings for Concrete Liberty E
 523 Insulating and Cellular Concrete Exeter B
 548-A Polymer Modified Concrete Beacon D
 350-5 Hazardous Material Subcommittee Dalton B

8:30 AM-1:00 PM

E703 Construction Practices Conference
 344 Circular Prestressed Conc. Structures (Mtg. 2) Liberty C
 349 Subcommittee 1 Exeter A
 349 Subcommittee 2 (Mtg. 1) Beacon A
 349 Subcommittee 3 Liberty A
 506 Shotcreting Beacon H

9:00 AM-NOON TECHNICAL SESSIONS:

The Importance of Flow Properties and Flow Patterns in Silo Design Independence East

Architectural Precast Concrete Design Considerations Independence Center

Concrete and Grouts in Nuclear and Hazardous Waste Disposal - Part I Independence West

★ New Developments in Concrete Pavements - Part I Fairfax A

MONDAY

Day / Time Function Room

MONDAY, MARCH 18, 1991

10:00 AM-11:30 AM

126.1	Cements	Beacon E
213-C	By-Product Lightweight Aggregates	Clarendon A
225-2	Expert Systems	Berkeley B
544-C	Synthetic Fibers	Fairfax B
544-H	Structural Uses of FRC	Hampton A

10:00 AM-1:00 PM

E902A	Field Technician I	Beacon F
207	Mass Concrete	Beacon C
214	Strength Tests	Republic A
223	Expansive Cement Concretes	Berkeley A
318	Standard Building Code (Mtg. 1)	Republic B
334	Concrete Shells	Board

11:30 AM-1:00 PM

E702	Designing Concrete Structures	Liberty D
E902C-3	Inspector III	Clarendon B
126.3	Chemical Admixtures	Beacon E
211-D	High Strength	Clarendon A
225-1	Math. Modeling	Berkeley B
350-3	Leakage Subcommittee	Dalton B
351-4	Grouting for Equipment Foundations	Dalton A
544-E	State-of-the-Art Report	Hampton A

2:00 PM-3:30 PM

E901	Scholarships	Exeter A
E902C	Concrete Insp. - General	Clarendon B
E902Z	Training Courses	Kent
126.4	Mineral Admixtures	Beacon E
211-E	Eval. and Adjustment	Dalton A
215	Fatigue of Concrete	Berkeley A
230	Soil Cement	Beacon H
352-5	Miscellaneous Joints	Beacon B

2:00 PM-5:00 PM TECHNICAL SESSIONS:

	Concrete and Grouts in Nuclear and Hazardous Waste Disposal - Part II	Independence West
★★	The 3 R's: Repair, Restoration and Rehabilitation	Commonwealth
★	New Developments in Concrete Pavements - Part II	Fairfax A

2:00 PM-5:00 PM

CMRC	Concrete Materials Research Council	Gardner A/B
E902-B	Lab Tech Certification	Beacon A
E902X-1	Formwork Detailer	Clarendon A
302	Construction of Concrete Floors	Hampton B
340	Design Aids for ACI Building Codes	Liberty A
366	Precast Pipelines	Beacon G
533	Precast Panels	Exeter B
548-E	Structural and Design Analysis of Polymer Concrete	Beacon D
555	Removal and Reuse of Concrete	Conference

MONDAY / TUESDAY

Day / Time Function

Room

MONDAY, MARCH 18, 1991**2:00 PM-5:30 PM TECHNICAL SESSION:**

★ Research in Progress Independence Center

2:00 PM-6:30 PM

228	Nondestructive Testing of Concrete	Beacon B
313	Concrete Bins & Silos (Mtg. 2)	Republic A
318-B	Reinforcement and Development	Fairfax B
318-C	Serviceability/Safety	Liberty C
318-D	Flexure and Axial Loads	Liberty D
318-F	Two-Way Slabs	Hampton A
349	Subcommittee 2 (Mtg. 2)	Beacon F
350-2	Seismic Subcommittee	Dalton B
531	Concrete Masonry	Liberty E
544	Fiber Reinforced Concrete	Republic B

3:30 PM-5:00 PM

IAC	International Activities	Beacon H
126.5	Properties & Performance	Beacon E
225	Hydraulic Cements	Jefferson
350-7	Concrete Protection Subcommittee	Clarendon B

3:30 PM-6:30 PM

RC	Publications Committee	Berkeley A
213-B	Responsibility in Concrete Construction	Dalton A
	Lightweight Concrete for Parking	Board
	Structures and Bridge Decks	
303	Architectural CIP Concrete	Berkeley B
358	Concrete Guideways	Exeter A
543	Concrete Piles	Kent

5:00 PM-6:30 PM

E902D	Concrete Finisher	Clarendon A
126.6	Processing	Beacon E
211-F	Mixture Submittal	Exeter B
350-9	Flood Considerations Subcommittee	Clarendon B

TUESDAY, MARCH 19, 1991**8:30 AM-10:00 AM**

E902X	New Certification Programs	Dalton A
E903	Convention Training	Clarendon B
	Membership Committee	Liberty D
211-A	Edit and Coordination	Berkeley A
227	Radioactive/Hazardous Waste Management	Beacon E
308-S	Specification	Liberty C
325-04	Jointed Concrete Pavement Design	Beacon D
364	Rehabilitation	Fairfax B
548-D	Sulfur Concrete	Dalton B

8:30 AM-11:30 AM

201	Durability of Concrete	Grand Ballroom
229	Controlled Low-Strength Material	Liberty E
360	Design of Slabs on Grade	Jefferson

TUESDAY

Day / Time Function

Room

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
350-1	Environmental Engrg. Conc. Struct. Code & Comm. Subcommittee	Clarendon 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
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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
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TUESDAY

Day / Time Function

Room

TUESDAY, MARCH 19, 1991**2:00 PM-3:00 PM OPEN DISCUSSION:**

Long Range Plan Republic A

2:00 PM-3:30 PM

211-B	Lightweight	Berkeley A
309-1	Cons. of Congested Areas	Gardner B
325-07	Roller Compacted Concrete	Beacon D
351	Foundations for Equip. and Machinery	Beacon H
554	Bearing Systems	Liberty D

2:00 PM-5:00 PM TECHNICAL SESSIONS/FORUM:★ Material Science and Modeling in Independence East
Concrete II: Overview★ Computer Applications in Concrete Independence West
Technology - Part II★ New Developments in Fiber Independence Center
Reinforced Concrete for the
21st Century - Part II

Computer-Aided Design of Concrete Shells Fairfax A

Forum: Architectural Commonwealth
Concrete Construction**2:00 PM-5:00 PM**

EAC	Educational Activities Committee (Mtg. 2)	Beacon A
210	Erosion of Conc. in Hydraulic Structures	Dalton B
330	Parking Lots	Liberty E
345	Bridge Construction	Exeter A
347	Formwork for Concrete	Beacon F
362	Parking Structures	Jefferson
421	Design of Concrete Slabs	Berkeley B
445	Shear and Torsion	Fairfax B

2:00 PM-6:30 PM

233	Ground Slag in Concrete	Liberty A
	Convention Committee	Liberty C
318	Standard Building Code (Mtg. 2)	Republic B
350	Environmental Engrg. Concrete Structures	Hampton A/B
524	Plastering (Mtg. 1)	Kent
546	Repair of Concrete	Grand Ballroom

3:30 PM-5:00 PM

JBRC	International Joints and Bearings	Liberty D
	Research Council	
213	Lightweight Aggregates and	Gardner A
	Lightweight Aggregate Concrete	
325-11	Fast Track Concrete Pavements & Overlays	Beacon D

3:30 PM-6:30 PM

548 Polymers in Concrete Gardner B



TUESDAY / WEDNESDAY

Day / Time Function Room

TUESDAY, MARCH 19, 1991**5:00 PM-6:30 PM**

E902	Certification (Mtg. 3)	Beacon C
222	Corrosion of Metals in Concrete	Gardner A
325-13	Drainage of Concrete Pavements	Beacon D
504	Joint Sealants and Joint Systems	Liberty D

7:00 PM-10:00 PM

124	Concrete Esthetics	Beacon D
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7:30 PM-10:00 PM FORUM

★	Forum: Cutting Edge Research - Where is it Leading Us?	Commonwealth
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WEDNESDAY, MARCH 20, 1991**8:30 AM-1:00 PM**

117	Tolerances	Liberty D
423	Prestressed Concrete	Gardner B

8:30 AM-10:00 AM

309-2	Eval. of Consolidation	Beacon C
325	Concrete Pavements	Fairfax B

8:30 AM-11:30 AM

121	Quality Assurance	Liberty C
224	Cracking	Gardner A
306	Cold Weather Concreting	Liberty E
315	Details of Concrete Reinforcement	Kent
441	Reinforced Concrete Columns	Beacon B
549	Ferrocement	Beacon D
550	Precast Concrete Structures	Board

9:00 AM-NOON TECHNICAL SESSIONS:

★	Meeting Transportation and Environmental Needs for the 21st Century	Fairfax A
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The Expanding World of Shrinkage- Independence West
Compensating Concrete

★	Lunar Concrete - Part I	Commonwealth
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★	Material Science and Modeling in Concrete III: Materials and Processing	Independence East
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Experimental Techniques: Independence Center
Traditional Approaches

9:00 AM-5:00 PM

	Board of Direction (Old)	Hampton A/B
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10:00 AM-11:30 AM

309-3	Consolidation of RCC	Beacon C
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11:30 AM-1:00 PM

232-A	Natural Pozzolans in Concrete	Beacon D
309	Consolidation of Concrete	Beacon C
517	Accelerated Curing	Kent

WEDNESDAY

Day / Time Function Room

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 Board

Concrete Structures

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

★ Lunar Concrete - Part II Commonwealth

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

209 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

524 Plastering (Mtg. 2) Clarendon B

3:30 PM-5:00 PM

116 Terminology and Notation Berkeley A

3:30 PM-6:30 PM

118 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

365 Service Life Prediction Gardner B

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

THURSDAY

Day / Time Function Room

THURSDAY, MARCH 21, 1991

8:00 AM-10:00 AM
Awards Breakfast Grand Ballroom

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

1:00 PM-3:30 PM
Standards Board Board

2:00 PM-3:30 PM
221 Aggregates Fairfax B
357 Offshore and Marine Concrete Liberty D

2:00 PM-4:00 PM TECHNICAL SESSION:
★ Fracture Mechanics of Dams Independence East

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

2:00 PM-5:00 PM
Board of Direction (New) Hampton A/B
123 Research Berkeley B
234 Silica Fume in Concrete Constitution
304 Meas., Mix., Transp., and Placing Beacon G
305 Hot Weather Concreting Liberty A
359 Nuclear Vessels Liberty C
444 Models of Concrete Structures Liberty E
547 Refractory Concrete (Mtg. 2) Beacon H

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

2:00 PM-6:30 PM
125 Lunar Concrete Gardner B
301 Specifications for Concrete Republic A
311 Inspection of Concrete Beacon C

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

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.

NUMERICAL COMMITTEE MEETING SCHEDULE

COMM.	COMMITTEE TITLE	DAY	TIME	ROOM
	Board of Direction (Old)	WED	9:00P- 5:00P	Hampton A/B
	Board of Direction (New)	THU	2:00A- 5:00P	Hampton A/B
	Standards Board	THU	1:00P- 3:30P	Board
TAC	Technical Activities Committee (Mtg. 1)	SAT	8:30A- 6:00P	Gardner A/B
TAC	Technical Activities Committee (Mtg. 2)	MON	8:00A- 1:00P	Gardner A/B
TAC	Review Group 1	SUN	8:30A- 6:00P	Gardner A/B
TAC	Review Group 2	SUN	8:30A- 6:00P	Dalton B
TAC	Review Group 3	SUN	8:30A- 6:00P	Clarendon A
TAC	Review Group 4	SUN	8:30A- 6:00P	Clarendon B
EAC	Educational Activities Committee (Mtg. 1)	SUN	9:00A- 5:00P	Exeter A/B
EAC	Educational Activities Committee (Mtg. 2)	TUE	2:00P- 5:00P	Beacon A
E701	Construction Materials	WED	2:00P- 3:30P	Exeter A
E702	Designing Concrete Structures	MON	11:30A- 1:00P	Liberty D
E703	Construction Practices	MON	8:30A- 1:00P	Conference
E705	Educational Computer Activities	MON	8:30A- 10:00A	Board
E801	Student Concrete Projects	MON	8:30A- 11:30A	Kent
E901	Scholarships	MON	2:00P- 3:30P	Exeter A
E902	Certification (Mtg. 1)	SUN	3:30P- 5:00P	Liberty E
E902	Certification (Mtg. 2)	TUE	10:00A- 1:00P	Beacon C
E902	Certification (Mtg. 3)	TUE	5:00P- 6:30P	Beacon C
E902A	Field Technician I	MON	10:00A- 1:00P	Beacon F
E902B	Lab Tech Certification	MON	2:00P- 5:00P	Beacon A
E902C	Concrete Insp.-General	MON	2:00P- 3:30P	Clarendon B
E902C-2	Inspector II	MON	8:30A- 11:30A	Clarendon B
E902C-3	Inspector III	MON	11:30A- 1:00P	Clarendon B
E902D	Concrete Finisher	MON	5:00P- 6:30P	Clarendon A
E902X	New Cert. Programs	TUE	8:30A- 10:00A	Dalton A
E902X-1	Formwork Detailer	MON	2:00P- 5:00P	Clarendon A
E902Z	Training Courses	MON	2:00P- 3:30P	Kent
E903	Convention Training	TUE	8:30A- 10:00A	Clarendon B
CAC	Chapter Activities	TUE	10:00A- 1:30P	Liberty D
CLC	Construction Liaison	SUN	10:00A- 1:00P	Liberty E
	Convention Committee	TUE	2:00P- 6:30P	Liberty C
	Hot Topic Subcommittee	SUN	2:00P- 3:30P	Liberty A
IAC	International Activities	MON	3:30P- 5:00P	Beacon H
	Membership Committee	TUE	8:30A- 10:00A	Liberty D
	Publications Committee	MON	3:30P- 6:30P	Berkeley A
CMRC	Concrete Materials Research Council	MON	2:00P- 5:00P	Gardner A/B
TCRC	Construction Review	SUN	2:00P- 3:30P	Liberty C
RC	Responsibility in Concrete Construction	MON	3:30P- 6:30P	Dalton A
	TAC Specifications Committee	WED	1:00P- 5:00P	Conference
JBRC	International Joints and Bearings Research Council	TUE	3:30P- 5:00P	Liberty D

COMM.	COMMITTEE TITLE	DAY	TIME	ROOM
116	Terminology and Notation	WED	3:30P- 5:00P	Berkeley A
117	Tolerances	WED	8:30A- 1:00P	Liberty D
118	Use of Computers	WED	3:30P- 6:30P	Jefferson
118-UG	Computer Users Group	WED	2:00P- 3:30P	Jefferson
120	History of Concrete	SUN	3:30P- 5:00P	Liberty C
121	Quality Assurance	WED	8:30A- 11:30A	Liberty C
122	Energy Conservation	TUE	10:00A- 11:30A	Dalton A
123	Research	THU	2:00P- 5:00P	Berkeley B
124	Concrete Esthetics	TUE	7:00P- 10:00P	Beacon D
125	Lunar Concrete	THU	2:00P- 6:30P	Gardner B
126	Concrete Materials Property Database	TUE	11:30A- 1:00P	Gardner B
126.1	Cements	MON	10:00A- 11:30A	Beacon E
126.2	Aggregates	MON	8:30A- 10:00A	Beacon E
126.3	Chemical Admixtures	MON	11:30A- 1:00P	Beacon E
126.4	Mineral Admixtures	MON	2:00P- 3:30P	Beacon E
126.5	Properties & Performance	MON	3:30P- 5:00P	Beacon E
126.6	Processing	MON	5:00P- 6:30P	Beacon E
201	Durability of Concrete	TUE	8:30A- 11:30A	Grand Blrm.
207	Mass Concrete	MON	10:00A- 1:00P	Beacon C
209	Creep and Shrinkage in Concrete	WED	2:00P- 5:00P	Liberty D
210	Erosion of Conc. in Hydraulic Structures	TUE	2:00P- 5:00P	Dalton B
211	Proportioning Concrete Mixtures	WED	3:30P- 6:30P	Republic A
211-A	Edit and Coordination	TUE	8:30A- 10:00A	Berkeley A
211-B	Lightweight	TUE	2:00P- 3:30P	Berkeley A
211-C	No Slump	TUE	11:30A- 1:00P	Berkeley A
211-D	High Strength	MON	11:30A- 1:00P	Clarendon A
211-E	Eval. and Adjustment	MON	2:00P- 3:30P	Dalton A
211-F	Mixture Submittal	MON	5:00P- 6:30P	Exeter B
212	Chemical Admixtures	MON	8:30A- 11:30A	Jefferson
213	Lightweight Aggregates and Lightweight Aggregate Concrete	TUE	3:30P- 5:00P	Gardner A
213-A	High-Strength Light- Weight Concrete	MON	8:30A- 10:00A	Hampton A
213-B	Lightweight Concrete for Parking Structures and Bridge Decks	MON	3:30P- 6:30P	Board
213-C	By-Product Lightweight Aggregates	MON	10:00A- 11:30A	Clarendon A
214	Strength Tests	MON	10:00A- 1:00P	Republic A
215	Fatigue of Concrete	MON	2:00P- 3:30P	Berkeley A
216	Fire Resistance and Fire Protection of Structures	TUE	10:00A- 11:30A	Berkeley A
221	Aggregates	THU	2:00P- 3:30P	Fairfax B
222	Corrosion of Metals in Concrete	TUE	5:00P- 6:30P	Gardner A
223	Expansive Cement Concretes	MON	10:00A- 1:00P	Berkeley A
224	Cracking	WED	8:30A- 11:30A	Gardner A

COMM.	COMMITTEE TITLE	DAY	TIME	ROOM
225	Hydraulic Cements	MON	3:30P- 5:00P	Jefferson
225-1	Math. Modeling	MON	11:30A- 1:00P	Berkeley B
225-2	Expert Systems	MON	10:00A- 11:30A	Berkeley B
227	Radioactive/Hazardous Waste Management	TUE	8:30A- 10:00A	Beacon E
228	Nondestructive Testing of Concrete	MON	2:00P- 6:30P	Beacon B
229	Controlled Low-Strength Material	TUE	8:30A- 11:30A	Liberty E
230	Soil Cement	MON	2:00P- 3:30P	Beacon H
231	Properties of Concrete at Early Ages	TUE	10:00A- 1:00P	Gardner A
232	Fly Ash and Natural Pozzolans in Concrete	WED	2:00P- 3:30P	Republic B
232-A	Natural Pozzolans in Concrete	WED	11:30A- 1:00P	Beacon D
233	Ground Slag in Concrete	TUE	2:00P- 6:30P	Liberty A
234	Silica Fume in Concrete	THU	2:00P- 5:00P	Constitution
301	Specifications for Concrete	THU	2:00P- 6:30P	Republic A
302	Construction of Concrete Floors	MON	2:00P- 5:00P	Hampton B
303	Architectural Concrete	MON	3:30P- 6:30P	Berkeley B
304	Meas., Mix., Transp., and Placing	THU	2:00P- 5:00P	Beacon G
305	Hot Weather Concreting	THU	2:00P- 5:00P	Liberty A
306	Cold Weather Concreting	WED	8:30A- 11:30A	Liberty E
307	Chimneys	TUE	10:00A- 1:00P	Clarendon B
308	Curing Concrete	TUE	11:30A- 1:00P	Liberty C
308-R	State-of-the-Art Report	TUE	10:00A- 11:30A	Liberty C
308-S	Specification	TUE	8:30A- 10:00A	Liberty C
309	Consolidation of Conc.	WED	11:30A- 1:00P	Beacon C
309-1	Cons. of Congested Areas	TUE	2:00P- 3:30P	Gardner B
309-2	Eval. of Consolidation	WED	8:30A- 10:00A	Beacon C
309-3	Consolidation of RCC	WED	10:00A- 11:30A	Beacon C
311	Inspection of Concrete	THU	2:00P- 6:30P	Beacon C
313	Concrete Bins & Silos (Mtg. 1)	SUN	7:00P- 8:30P	Republic A
313	Concrete Bins & Silos (Mtg. 2)	MON	2:00P- 6:30P	Republic A
313	Concrete Bins & Silos (Mtg. 3)	TUE	8:30A- 1:00P	Republic A
315	Details of Concrete Reinforcement	WED	8:30A- 11:30A	Kent
318	Standard Building Code (Mtg. 1)	MON	10:00A- 1:00P	Republic B
318	Standard Building Code (Mtg. 2)	TUE	2:00P- 6:30P	Republic B
318-A	General, Concrete Construction	TUE	8:30A- 1:00P	Hampton A
318-B	Reinforcement and Development	MON	2:00P- 6:30P	Fairfax B
318-C	Serviceability/Safety	MON	2:00P- 6:30P	Liberty C
318-D	Flexure and Axial Loads	MON	2:00P- 6:30P	Liberty D

COMM.	COMMITTEE TITLE	DAY	TIME	ROOM
318-E	Shear and Torsion	TUE	8:30A- 1:00P	Beacon G
318-F	Two-Way Slabs	MON	2:00P- 6:30P	Hampton A
318-G	Prestressed Precast	TUE	8:30A- 1:00P	Beacon F
318-H	Seismic Provisions	TUE	8:30A- 1:00P	Hampton B
318.1-TGP	Building Code Requirements for Structural Plain Concrete	SUN	3:30P- 5:00P	Dalton A
325	Concrete Pavements	WED	8:30A- 10:00A	Fairfax B
325-04	Jointed Concrete Pavement Design	TUE	8:30A- 10:00A	Beacon D
325-07	Roller Compacted Conc.	TUE	2:00P- 3:30P	Beacon D
325-11	Fast Track Concrete Pavements & Overlays	TUE	3:30P- 5:00P	Beacon D
325-13	Drainage of Concrete Pavements	TUE	5:00P- 6:30P	Beacon D
330	Parking Lots	TUE	2:00P- 5:00P	Liberty E
332	Residential Concrete	MON	8:30A- 11:30A	Hampton B
334	Concrete Shells	MON	10:00A- 1:00P	Board
336	Footings	MON	8:30A- 11:30A	Liberty D
340	Design Aids for ACI Building Codes	MON	2:00P- 5:00P	Liberty A
341	Earthquake Resistant Concrete Bridges	SUN	10:00A- 1:00P	Beacon B
343	Concrete Bridge Design	SUN	1:00P- 4:00P	Beacon C
343/348	Task Committee on LRFD	SUN	4:00P- 5:30P	Beacon C
344	Circular Prestressed Concrete Structures (Mtg. 1)	SUN	8:30A- 11:00A	Liberty C
344	Circular Prestressed Concrete Structures (Mtg. 2)	MON	8:30A- 1:00P	Liberty C
345	Bridge Construction	TUE	2:00P- 5:00P	Exeter A
347	Formwork for Concrete	TUE	2:00P- 5:00P	Beacon F
348	Structural Safety	WED	2:00P- 3:30P	Beacon C
348/343	Task Committee on LRFD	SUN	4:00P- 5:30P	Beacon C
349	Nuclear Structures	TUE	8:30A- 1:00P	Liberty A
349	Subcommittee 1	MON	8:30A- 1:00P	Exeter A
349	Subcommittee 2 (Mtg. 1)	MON	8:30A- 1:00P	Beacon A
349	Subcommittee 2 (Mtg. 2)	MON	2:00P- 6:30P	Beacon F
349	Subcommittee 3	MON	8:30A- 1:00P	Liberty A
350	Environmental Engrg. Concrete Structures	TUE	2:00P- 6:30P	Hampton A/B
350-1	Environmental Engrg. Conc. Struct. Code & Comm. Subcommittee	TUE	8:30A- 1:00P	Clarendon A
350-2	Seismic Subcommittee	MON	2:00P- 6:30P	Dalton B
350-3	Leakage Subcommittee	MON	11:30A- 1:00P	Dalton B
350-5	Hazardous Material Subcommittee	MON	8:30A- 11:30P	Dalton B
350-6	Education Subcommittee	TUE	11:30A- 1:00P	Dalton A
350-7	Concrete Protection Subcommittee	MON	3:30P- 5:00P	Clarendon B

COMM.	COMMITTEE TITLE	DAY	TIME	ROOM
350-9	Flood Considerations Subcommittee	MON	5:00P- 6:30P	Clarendon B
351	Foundations for Equip. and Machinery	TUE	2:00P- 3:30P	Beacon H
351-3	Static Equipment Foundations	MON	8:30A- 11:30A	Dalton A
351-4	Grouting for Equipment Foundations	MON	11:30A- 1:00P	Dalton A
352	Joints and Connections in R/C Structures	SUN	2:00P- 5:00P	Beacon B
352-5	Miscellaneous Joints	MON	2:00P- 3:30P	Beacon C
355	Anchorage to Concrete	SUN	1:00P- 5:30P	Fairfax B
357	Offshore and Marine Concrete	THU	2:00P- 3:30P	Liberty D
358	Concrete Guideways	MON	3:30P- 6:30P	Exeter A
359	Nuclear Vessels	THU	2:00P- 5:00P	Liberty C
360	Design of Slabs on Grade	TUE	8:30A- 11:30A	Jefferson
361	Pressure Vessels	MON	8:30A- 10:00A	Berkeley B
362	Parking Structures	TUE	2:00P- 5:00P	Jefferson
363	High-Strength Concrete	TUE	10:00A- 11:30A	Fairfax B
364	Rehabilitation	TUE	8:30A- 10:00A	Fairfax B
365	Service Life Prediction	WED	5:00P- 6:30P	Gardner B
366	Precast Pipelines	MON	2:00P- 5:00P	Beacon G
368	Earthquake Resistance Members/Systems	MON	8:30A- 11:30A	Beacon B
408	Bond and Development of Reinforcement	SUN	2:00P- 5:00P	Republic A
421	Design of Concrete Slabs	TUE	2:00P- 5:00P	Berkeley B
423	Prestressed Concrete	WED	8:30A- 1:00P	Gardner B
435	Deflection	WED	3:30P- 6:30P	Board
437	Strength Evaluation of Existing Concrete Structures	WED	2:00P- 3:30P	Board
439	Steel Reinforcement	WED	2:00P- 5:00P	Gardner B
441	Reinforced Concrete Columns	WED	8:30A- 11:30A	Beacon B
442	Lateral Forces	WED	2:00P- 5:00P	Liberty E
444	Models of Concrete Structures	THU	2:00P- 5:00P	Liberty E
445	Shear and Torsion	TUE	2:00P- 5:00P	Fairfax B
446	Fracture Mechanics (Mtg. 1)	WED	3:30P- 6:30P	Fairfax B
446	Fracture Mechanics (Mtg. 2)	THU	5:00P- 7:00P	Berkeley B
446-2	Fracture Mechanics and the Code	WED	2:00P- 3:30P	Exeter B
447	Finite Element Analysis of Reinforced Concrete Structures	SUN	7:00P- 10:00P	Jefferson
503	Adhesives for Concrete	WED	2:00P- 5:00P	Liberty C
504	Joint Sealants and Joint Systems	TUE	5:00P- 6:30P	Liberty D

COMM.	COMMITTEE TITLE	DAY	TIME	ROOM
506	Shotcreting	MON	8:30A- 1:00P	Beacon H
515	Coatings for Concrete	MON	8:30A- 11:30A	Liberty E
517	Accelerated Curing	WED	11:30A- 1:00P	Kent
523	Insulating and Cellular Concrete	MON	8:30A- 11:30A	Exeter B
524	Plastering (Mtg. 1)	TUE	2:00P- 6:30P	Kent
524	Plastering (Mtg. 2)	WED	2:00P- 6:30P	Clarendon B
531	Concrete Masonry Structures	MON	2:00P- 6:30P	Liberty E
533	Precast Panels	MON	2:00P- 5:00P	Exeter B
543	Concrete Piles	MON	3:30P- 6:30P	Kent
544	Fiber Reinforced Conc.	MON	2:00P- 6:30P	Republic B
544-A	Steel Fibers	MON	8:30A- 10:00A	Fairfax B
544-B	Glass Fibers	MON	8:30A- 10:00A	Beacon F
544-C	Synthetic Fibers	MON	10:00A- 11:30A	Fairfax B
544-H	Structural Uses of FRC	MON	10:00A- 11:30A	Hampton A
544-E	State-of-the-Art Report	MON	11:30A- 1:00P	Hampton A
545	Railroad Ties	TUE	11:30A- 1:00P	Liberty E
546	Repair of Concrete	TUE	2:00P- 6:30P	Grand Blrm.
547	Refractory Concrete (Mtg. 1)	WED	2:00P- 5:00P	Beacon H
547	Refractory Concrete (Mtg. 2)	THU	2:00P- 5:00P	Beacon H
548	Polymers in Concrete	TUE	3:30P- 6:30P	Gardner B
548-A	Polymer Modified Conc.	MON	8:30A- 11:30A	Beacon D
548-B	Polymer Conc. Overlays	TUE	10:00A- 1:00P	Beacon D
548-D	Sulfur Concrete	TUE	8:30A- 10:00A	Dalton B
548-E	Structural and Design Analysis of Polymer Conc.	MON	2:00P- 5:00P	Beacon D
549	Ferrocement	WED	8:30A- 11:30A	Beacon D
550	Precast Conc. Structures	WED	8:30A- 11:30A	Board
551	Tilt-Up Concrete Const.	WED	2:00P- 5:00P	Clarendon A
552	Geotechnical Cement Grouting	WED	2:00P- 3:30P	Kent
554	Bearing Systems	TUE	2:00P- 3:30P	Liberty D
555	Removal and Reuse of Concrete	MON	2:00P- 5:00P	Conference
	Ad Hoc Committee on Short Duration Dynamic & Vibratory Load Effects	SUN	2:00P- 5:00P	Jefferson
	Proposed Committee on Fiber Reinforced Plastic Reinforcement	TUE	10:00A- 11:30A	Gardner B

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. Dhingra
Vice President
James M. Montgomery,
Consulting Engineers, Inc.
Pasadena, California

Introduction 2:00
Ashok K. Dhingra, Vice President, James M. Montgomery, Consulting Engineers, Inc., Pasadena, California

Rehabilitation of Reinforced Concrete Parking Structures Using Cathodic Protection 2:15
Philip J. Zivich, Principal Marketing Engineer, ELGARD Corp., Chardon, Ohio

Rehabilitation of the Worcester Market Building, Worcester, Massachusetts 2:50
David P. Herr, Principal, D. H. Engineering Associates, Boston, Massachusetts

Strengthening of Concrete Structures with Prestressed CFRP Sheets 3:25
Thanasis C. Triantafilou, Assistant Professor of Civil Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts

Innovative Concrete Slab Strengthening Using Unbonded Post-Tensioning 4:00
Florian G. Barth, President, Bijan, Florian & Associates, Inc., Redwood City, California

Rehabilitation of Transit Structures — Old Problems and Innovative Solutions 4:30
Mysore Nagaraja, Deputy Vice President and Chief Engineer, New York Transit Authority, New York, New York

TECHNICAL SESSION

MONDAY, March 18
9:00 AM - NOON

Room: *Independence East*

THE IMPORTANCE OF FLOW PROPERTIES AND FLOW PATTERNS IN SILO DESIGN

Sponsored by Committee 313

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

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

Introduction John E. Sadler, Consulting Engineer, Columbus, Ohio	9:00
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, Hørsholm, Denmark	9:10
Analysis of Silo Failures from Asymmetric Flow F. Thomas Johnston, President, Facility Design, Inc., Columbus, Ohio	9:35
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	10:00
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	10:35
New Silo Theory Based on the Development of Expansion Zones I.A.S.Z. Peschl, President, Siloproject BV, Sterksel, Holland	11:00
Future Revisions to Chapter 4 of ACI 313 Mostafa H. Mahmoud, Vice President, SEI Engineers, Inc., Worthington, Ohio	11:25

TECHNICAL SESSION

MONDAY, March 18
9:00 AM - NOON

Room: Independence West

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

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

**Considerations for the Design and Construction
of a Reinforced Concrete Low-Level Waste Facility** 9:00
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 Concrete Structures in Low-Level
Radioactive Waste Disposal Units** 9:30
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 10:00
Ladislav Konecny, Design Engineer, Radioactive
Materials Management Section, Ontario Hydro,
Toronto, Ontario, Canada

**Creep and Shrinkage of Cement-Based Grouts
Containing Silica Fume at High Temperatures** 10:30
Akthem 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

Room: Independence West

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

Sponsored by Committee 227

continued

**The 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

TECHNICAL SESSION

MONDAY, March 18
9:00 AM - NOON

Room: Independence Center

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 Sidney Freedman, Director, Architectural Precast Concrete Services, Precast/Prestressed Concrete Institute, Chicago, Illinois	9:00
Design Responsibility and Structural Design Considerations Donald F. Meinheit, Senior Consultant, Wiss, Janney, Elstner Associates, Inc., Northbrook, Illinois	9:05
Reinforcement and Connection Design Michael D. Abbruzese, Vice President, Engineering, Art Cement Products Co., Inc., Wilbraham, Massachusetts	9:50
Performance of Precast Concrete Cladding in Recent Earthquakes Barry J. Goodno, Professor, School of Civil Engineering, Georgia Institute of Technology, Atlanta, Georgia	10:30
Surface Aesthetics Sidney Freedman, Director, Architectural Precast Concrete Services, Precast/Prestressed Concrete Institute, Chicago, Illinois	11:15

MONDAY, March 18
9:00 AM - NOON

Room: **Fairfax A**

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 | 9:00 |
| 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 | 9:05 |
| 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 | 9:30 |
| 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 | 10:00 |
| M. Nasser Darwish, Lecturer, Department of Civil Engineering, Alexandria University, Alexandria, Egypt | |
| Prestressed Concrete Pavement — Design, Construction and Performance | 10:30 |
| 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 | 11:00 |
| 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 | 11:30 |
| James M. Shilstone, Sr., President, Shilstone & Associates, Inc., Dallas, Texas | |

TECHNICAL SESSION

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

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** 2:00
Peter G. Snow, President, PGS & Associates, Inc.,
Riviera Beach, Florida
- ACI International Conference on Evaluation and
Rehabilitation of Concrete Structures and
Innovations in Design** 2:05
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** 2:10
Peter H. Emmons, President, Structural Preservation
Systems, Inc., Baltimore, Maryland
- Rehabilitation and Restoration of a Water Storage
Tank Built in 1927** 2:30
Ashok K. Dhingra, Vice President,
James M. Montgomery, Consulting Engineers, Inc.,
Pasadena, California
- Historical Research: A Key to Successful Retrofitting** 2:50
Jose M. Izquierdo, Partner, Izquierdo,
Rueda & Associates Consulting Engineers,
Rio Piedras, Puerto Rico
- Rehabilitation and Modernization of Existing Subways:
Developing Technology** 3:10
Minhaj Kirmani, Principal, Weidlinger Associates,
Cambridge, Massachusetts

continued

TECHNICAL SESSION

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 Deschappelles, 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

TECHNICAL SESSION

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

Room: Independence West

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** 2:00
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** 2:30
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** 3:00
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** 3:30
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** 4:00
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** 4:30
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

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

Room: Fairfax A

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 | 2:00 |
| Roller Compacted Concrete Pavements:
Future Directions
Shiraz D. Tayabji, Division Manager, PCS/Law
Engineering, Beltsville, Maryland | 2:05 |
| 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. | 2:30 |
| 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 | 3:00 |
| Control of Cracking Related to Dowels and Tie-Bars
Ernest K. Schrader, Civil Engineer and Concrete
Specialist, Schrader Consulting, Walla Walla,
Washington | 3:30 |
| 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 | 4:00 |
| 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 | 4:30 |

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** 2:00
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** 2:05
Paul J. Seppanen, Student, Winona High School,
Winona, Minnesota
- Brittle-Ductile Transition of Polymer Concrete** 2:25
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** 2:45
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** 3:05
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** 3:25
Andre Filiatrault, Assistant Professor, Department of
Civil Engineering, Ecole 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

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

Room: Independence Center

RESEARCH IN PROGRESS

Sponsored by Committee 123

continued

- Toughness Indices of Fiber Reinforced Concrete Using a New Test Procedure** 3:45
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** 4:05
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** 4:25
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** 4:45
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** 5:05
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

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 9:00
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** 9:05
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** 9:30
Sashi Kunnath, Research Assistant Professor, and
Andrei Reinhorn, Professor, State University of New
York at Buffalo, Buffalo, New York; and Nader
Panashahi, Assistant Professor, Southern Illinois
University at Edwardsville, Edwardsville, Illinois

Computer Monitoring the Micro-Environment of Concrete 9:55
Ronald G. Grieve, President, Tekron Services, Inc.,
Mississauga, Ontario, Canada

Project Concrete Quality Assurance System (PCQAS) 10:20
William F. Kepler, Civil Engineer, U. S. Bureau of
Reclamation, Denver, Colorado

Analysis of Circular Tanks for Water Retaining Structures 10:45
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** 11:10
Yun-Sool Joo, Engineer; Edward M. Frisbee,
Vice President, Engineering; Sam Pizzuto,
Superintendent - Production; and Ted Wolfsthal,
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 Tedesko, Consulting Engineer, Bronxville, New York	9:00
Large Barrel Shell Roofs by Ammann & Whitney Edward Cohen, Managing Partner, Ammann & Whitney, New York, New York	9:15
Thin Shell Roof Designs Jack Christiansen, Consulting Engineer, Seattle, Washington	10:00
Milo S. Ketchum and the Exploration of Form David P. Billington, Professor, Department of Civil Engineering and Operations Research, Princeton University, Princeton, New Jersey	10:45
Response and Discussion Milo S. Ketchum, Consulting Engineer, Denver, Colorado	11:30

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 Chern, 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

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

continued

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| Development of a Field Permeability Test Apparatus and Method for Concrete | 11:00 |
| 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 | 11:20 |
| 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 | 11:40 |
| 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

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

continued

**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

CONTRACTORS' DAY

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	9:00
Arthur T. Weiss, Jr., Certified Construction Specifier, The Weiss Agency, Inc., Denver, Colorado	
CSI Modification to ACI Format	9:15
Ronald L. Hollrah, Partner, Black & Veatch, Kansas City, Missouri	
Style, Language and Usage	9:35
Thomas B. Dedmon, Jr., Senior Engineer Designer, El du Pont de Nemours, Newark, Delaware	
Legal Consequences	9:55
Jonathan L. Alpert, Partner, Alpert, Josey & Grilli, Tampa, Florida	
Drafting a Specification, Accumulating Information, Assigning Topics by Part, and CSI Masterformat and Section Format	10:20
Arthur T. Weiss, Jr., Certified Construction Specifier, The Weiss Agency, Inc., Denver, Colorado	
Drafts: Part 1 (General), Part 2 (Products), and Part 3 (Execution)	11:10
Arthur T. Weiss, Jr., Certified Construction Specifier, The Weiss Agency, Inc., Denver, Colorado	
Editing, Final Assembly, and Submittal for the Review Process	11:40
Alfred L. Kaufman, Jr., Technical Services Manager, RMC Lonestar, San Ramon, California	
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

CONTRACTORS' DAY

TUESDAY, March 19
2:00 PM - 5:00 PM

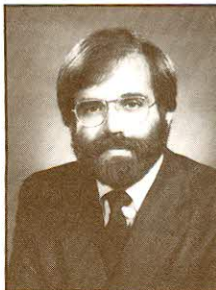
Room: Commonwealth

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	2:00
Claude B. Trusty, Jr., Vice President, Technical Services, CBR Cement Corp., San Mateo, California	
High Strength Architectural Concrete	2:05
Michel Lessard, Student, and Pierre-Claude Aïtcin, Professor, Department of Civil Engineering, University of Sherbrooke, Sherbrooke, Quebec, Canada	
Advances in Architectural Forms and Linings	2:40
Jerome H. Ford, Sales Manager, Symons Corp., Des Plaines, Illinois	
Developments in Consolidation Equipment and Procedures	3:15
Allan R. Kenney, President, Precast Systems Consultants, Inc., Venice, Florida	
New Materials and Methods for Repair	3:50
Alfred D. Perez, Jr., President, Concrete Restoration Service, Inc., Irving, Texas	
Sealers, Need, and What is Available	4:25
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.

TECHNICAL SESSION

TUESDAY, March 19
2:00 PM - 5:00 PM

Room: Independence West

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** 2:00
Thomas H. Wenzel, Associate Professor, Department of Civil Engineering, Marquette University, Milwaukee, Wisconsin
- Software Engineering Guidelines for the Development of Computer Models in a Cementitious Materials Modeling Laboratory** 2:05
Lawrence J. Kaetzel, 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
- COLSHO — Computer Program on Creep and Shrinkage for Concrete Columns** 2:30
C. Thomas Jan, Structural Engineer, DRC Consultants, Inc., Flushing, New York, and Abdul-lateef M. Al-Khaleefi, Assistant Professor, Kuwait University, Kuwait
- Automatic Design/Detailing of Seismic Resistant R/C Buildings** 2:55
Michael N. Fardis, Professor, Department of Civil Engineering, University of Patras, Patras, Greece, and A. Habis, Civil Engineer, Athens, Greece
- Elasto-Plastic Analysis and Design of Concrete Frames** 3:20
Apostolos Fafitis, Associate Professor, and Hajay Kadam, Graduate Student, Department of Civil Engineering, Arizona State University, Tempe, Arizona
- Computer-Aided Highway Bridge Graphics System** 3:45
Abraham A. Abugattas, Manager, Highways and Bridges, and Joseph A. Bohinsky, Manager, Civil and Structural Department, Brown & Root, Inc., Houston, Texas
- Construction Load Analysis Using Microcomputers** 4:10
Pericles C. Stivaros, Structural Engineer, Feld, Kamietzky & Cohen, Roslyn Heights, New York, and Grant T. Halvorsen, Associate, Carl A. Peterson and Associates, Inc., Northbrook, Illinois

TUESDAY, March 19
2:00 PM - 5:00 PM

Room: Fairfax A

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

TECHNICAL SESSION

TUESDAY, March 19
2:00 PM - 5:00 PM

Room: **Independence East**

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** 2:00

Per Just Andersen, Industrial Researcher, and Vagn Johansen, Chief Engineer, G. M. Idorn Consult A/S, Birkerød, Denmark

**Modeling the Size Distribution of Air Voids in
Hardened Air-Entrained Concrete** 2:20

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** 2:40

Sandor Popovics, Professor, Department of Civil and Architectural Engineering, Drexel University, Philadelphia, Pennsylvania

**Actual Mean Spacing of Air-Void System
in Hardened Concrete** 3:00

Emmanuel K. Attiogbe, Senior Research Engineer, Master Builders, Inc., Cleveland, Ohio

BREAK/OPEN DISCUSSION 3:20

**On the Physical Origin of Drying Creep:
Another Look Thanks to Silica Fume Concrete** 3:40

Francois de Larrard, Section Chief, Ministere De L Equipement, Du Logement, Laboratoire Central Des Ponts ET Chaussees, Paris, France

continued

TUESDAY, March 19
2:00 PM - 5:00 PM

Room: Independence East

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

continued

Filler and Pozzolanic Effects in High-Strength Concretes 4:00

A. Goldman, Faculty of Civil Engineering, and Arnon
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. Papdakis,
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

TECHNICAL SESSION

TUESDAY, March 19
2:00 PM - 5:00 PM

Room: **Independence Center**

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** 2:00
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** 2:05
Neal S. Berke, Construction Products Division,
W. R. Grace & Co., Cambridge, Massachusetts
- Carbon Fiber Reinforced Cementitious Systems:
Some Mechanical and Durability Considerations** 2:30
Nemkumar Banthia, Assistant Professor, Department of
Civil Engineering, Laval University, Ste-Foy, Quebec,
Canada

continued

TUESDAY, March 19
2:00 PM - 5:00 PM

Room: Independence Center

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

Sponsored by Committees 544 and 549

continued

- Direct Exterior Finish Systems (DEFS) Using
Fiber Reinforced Cement Board Substrates** 3:00
Barzin Mobasher and Thomas F. Sheppard, Technical
Staff; and Richard E. Slager and Wiley E. Krapf;
Development Associates, Research and Development,
USG Corp., Libertyville, Illinois
- Comparison of Performance of Different Types of
Fibers Using the Ring Test** 3:30
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** 4:00
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** 4:30
Parviz Soroushian, Professor, and Shashidara
Marikunte, Graduate Student, Department of Civil and
Environmental Engineering, Michigan State University,
East Lansing, Michigan

OPEN DISCUSSION

TUESDAY, March 19
2:00 PM - 3:00 PM

Room: **Republic A**

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

TUESDAY, March 19
7:30 PM - 10:00 PM

Room: Commonwealth

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	7:30
Robert L. Henry, Senior Consultant, Bowen Structures, Bedford, Texas	
Research Needs Survey	7:35
G. W. DePuy, Supervisory Materials Research Engineer, U. S. Bureau of Reclamation, Denver, Colorado	
Research: Public Works Point of View	7:40
Thomas J. Pasko, Jr., Director, Engineering and Highway Operations Research and Development, Federal Highway Administration, Annandale, Virginia	
Research: Private Industry Point of View	7:50
George C. Hoff, Senior Associate Engineer, Mobile Research and Development Corp., Dallas, Texas	
Research: Materials Properties Point of View	8:00
V. M. Malhotra, Head, Construction Materials Section, CANMET, Ottawa, Ontario, Canada	
Research: Field Engineering Point of View	8:10
Jamie Moreno, Manager, Technical Marketing, Material Service Corp., Chicago, Illinois	
Research: Contractors' Point of View	8:20
Eugene H. Boeke, Jr., Vice President, Beers Construction Co., Atlanta, Georgia	
Panel/Floor Open Discussion	8:30
"Put Your Money Where Your Mouth Is"	9:45
All Panelists	

EDUCATIONAL SESSION

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

Room: Republic A

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 7:00

**Proven Techniques for Lowering the Quality
of a Presentation** 7:20

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!** 7:40

Bertold E. Weinberg, Senior Project Manager,
New York Dormitory Authority, Delmar, New York

Evaluation and Adjournment 8:20

WEDNESDAY, March 20
9:00 AM - NOON

Room: Fairfax A

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	9:00
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	9:15
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	9:45
Larry Williamson, Senior Design Manager, Massachusetts Water Resources Authority, Boston, Massachusetts	
Overview: Central Artery/Third Harbor Tunnel Project	10:15
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	10:40
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	11:05
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	11:30
Kenneth R. Ware, Manager of Technical Services, Bechtel/Parsons Brinckerhoff, Boston, Massachusetts	

TECHNICAL SESSION

WEDNESDAY, March 20
9:00 AM - NOON

Room: Independence Center

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
Perdikaris, Associate Professor, Department of Civil
Engineering, Case Western Reserve University,
Cleveland, Ohio

continued

TECHNICAL SESSION

WEDNESDAY, March 20
9:00 AM - NOON

Room: *Independence Center*

EXPERIMENTAL TECHNIQUES: TRADITIONAL APPROACHES

Sponsored by Committee 444

continued

Experimental Evaluation of Concrete

Interface Shear Transfer

11:00

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

11:30

Roman Sorokko, Structural Engineer, Sheladia
Associates, Inc., New York, New York, and Gajanan
Sabnis, Professor, Department of Civil Engineering,
Howard University, Washington, D.C.

TECHNICAL SESSION

WEDNESDAY, March 20
9:00 AM - NOON

Room: Commonwealth

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 9:00

Lt. General Sam Armstrong, Director of Programs
Architecture, Synthesis Group, Arlington, Virginia

**What Every Engineer Should Know
About Gravity and Relativity** 9:35

George D. Nasser, Editor-in-Chief, PCI Journal,
Precast-Prestressed Concrete Institute, Chicago, Illinois

Cementitious Material Extraction from Lunar Resources 9:50

Shinji Matsumoto, General Manager, The Construction
Engineering Department; Tetsuji Yoshida, Manager;
and Kenji Takagi, Space Project Office, Shimizu Corp.,
Tokyo, Japan

Optimizing Lunar Concrete 10:10

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 10:30

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 10:50

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

continued

TECHNICAL SESSION

WEDNESDAY, March 20
9:00 AM - NOON

Room: Commonwealth

LUNAR CONCRETE — PART I

Sponsored by Committee 125

continued

Lunar Concrete Construction Requires New Value System and Concepts

11:10

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

11:30

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

WEDNESDAY, March 20
9:00 AM - NOON

Room: **Independence East**

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** 9:00
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 9:20
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 9:40
James M. Shilstone, Sr., President, Shilstone &
Associates, Inc., Dallas, Texas

The Composition of DSP Cement Pastes 10:00
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 10:20

Performance of DSP Mortars 10:40
J. Francis Young, Professor; H. Hsieh, Graduate
Student; B. M. Hornel, Research Assistant; and
T. A. Bier, Research Assistant, Department of Civil
Engineering, University of Illinois at Champaign-Urbana,
Urbana, Illinois

continued

WEDNESDAY, March 20
9:00 AM - NOON

Room: Independence East

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

continued

- 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 Vector Thrust Aircraft** 11:20
Larry C. Muszynski, Principal Engineer, and Charles E. Bailey, Applied Research Associates, Inc., Tyndall Air Force Base, Florida
- 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	9:00
Herbert G. Gelhardt III, Civil Engineer, International Admixtures, Inc., Boca Raton, Florida	
Manufacturing SCC Since 1969 as a Concrete Producer	9:05
Al Kaufman, Chief, Quality Control, RMC Lonestar, San Ramon, California	
Bridge Decks and SCC: Why?	9:35
Alan Plain, Engineer, Ohio Turnpike Commission, Berea, Ohio	
Use of SCC on Ohio Turnpike Bridge Decks	10:05
Paul W. Gruner, Engineer, Woolpert Consultants, Dayton, Ohio	
Methods of Use of SCC in Specialty Concrete Floors	10:30
Pat Harrison, Project Manager, John Rohrer Construction, Kansas City, Kansas	
Looking at Length-to-Width Ratio and Joints in Floor Placing of SCC	11:00
Terry Fricks, President, Terry J. Fricks, Inc., Ft. Worth, Texas	
Strain Gage Testing of SCC Concrete	11:35
Edward K. Rice, President, C.T.S., Los Angeles, California	

EDUCATIONAL SEMINAR

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 12:45
George F. Baty, President, Cresset Chemical Co.,
Weston, Ohio

How to Make and Use Technical Slides 12:55
Peter McCoy, Technical Sales Representative,
Eastman Kodak Co., Wellesley, Massachusetts

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. Guecia, 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 Messurier
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

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

Room: Independence West

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 2:00
Mohamad H. Hussein, Manager and Senior Engineer,
Goble Rausche Likins and Associates, Inc.,
Orlando, Florida

**Assessment of Creep and Shrinkage in
High-Strength Concrete Columns** 2:25
C. Thomas Jan, Structural Engineer, Weidlinger
Associates, New York, New York

Static and Dynamic Friction Tests in Concrete Elements 2:50
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 3:15
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** 3:40
Daniel O'Connor, Graduate Student, and M. Saïdi,
Professor, Department of Civil Engineering,
University of Nevada-Reno, Reno, Nevada

**Bond of Epoxy-Coated Reinforcement
Under Repeated Loading** 4:05
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" 4:30
Brian Kehoe, Senior Engineer, Wiss, Janney, Elstner
Associates, Inc., Emeryville, California

TECHNICAL SESSION

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

Room: Commonwealth

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

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

2:00

Stresses in Concrete Panels Exposed to the Sun on the Moon

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

2:05

The Role of CETEC (Center for Extraterrestrial Engineering and Construction) in the Development of Lunar Concrete

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

2:25

continued

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

Room: Commonwealth

LUNAR CONCRETE — PART II

Sponsored by Committee 125

continued

**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

TECHNICAL SESSION

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

Room: Independence East

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

WEDNESDAY, March 20**Room: Independence East**

2:00 PM - 5:00 PM

**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 Sotoodehnia, 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 Beliveau; 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

AWARDS BREAKFAST

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

Room: **Grand Ballroom**

AWARDS BREAKFAST

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

Albemarle 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

STANDARDS PRESENTATION

THURSDAY, March 21

Room: **Ballroom A**
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

Room: Independence East

FRACTURE MECHANICS OF DAMS

Sponsored by Committee 446

Session Chairman: Zdeněk P. Bazant
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. Bazant, 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

TECHNICAL SESSION

THURSDAY, March 21

Room: Fairfax A

2:00 PM - 5:00 PM

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 | 2:00 |
| Electrochemical Corrosion Rate Meter for
On-Site Measurement of Concrete Structures
Carmen Andrade, Research Professor; S. Feliu,
Research Professor; J. A. Gonzalez, Research
Professor; C. Alonso, Researcher; and M. Garcia,
Research Assistant, CSIC, Madrid, Spain | 2:05 |
| 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 | 2:30 |
| Predicting Time to Maintenance Using the
Three Electrode Polarization Technique
Kenneth C. Clear, President, Kenneth C. Clear, Inc.,
Sterling, Virginia; William T. Scannell, Concrete
Corrosion Specialist, and Ali Akbar Sohanghpurwala,
Concrete Corrosion Specialist, CONCOR, Inc., Sterling,
Virginia | 2:55 |
| 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 | 3:20 |

continued

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

continued

- Corrosion Rate Measurements in Reinforced Concrete Structures** 3:45
Kurt M. Lawson, Staff Engineer, and Neil G. Thompson,
President, C. C. Technologies, Columbus, Ohio
- Operational Experience Using Radar and Thermography for Bridge Deck Condition Surveys** 4:10
David G. Manning, Head, Materials Research, and Tony
Masliwec, Research Scientist, Ontario Ministry of
Transportation, Downsview, Ontario, Canada
- Methods for Detecting Corrosive Environments and Active Corrosion of Prestressing Steel** 4:35
V. Novokshchenov, Consultant, Concrete Clinic
International, Inc., Gibsonia, Pennsylvania

TECHNICAL SESSION

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

Room: Independence West

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
Institut 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

TECHNICAL SESSION

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

Room: Independence West

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

Sponsored by Committee 216

continued

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
Leslie D. Martin, President, CEG-IL, The Consulting
Engineers Group, Inc., Mt. Prospect, Illinois
- 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'Arcy, President, CEG-Texas, The
Consulting Engineers Group, Inc., San Antonio, Texas

TECHNICAL SESSION

THURSDAY, March 21

Room: Commonwealth

2:00 PM - 5:30 PM

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 Gunitite
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 Gunitite
Construction Co., Ravenel, South Carolina

**Durability of Dry-Mix Shotcrete Containing
Rapid Set Accelerators** 3:00
Steven H. Gebler, Principal Evaluation Engineer, and
Albert Litvin, Consultant, Construction Technology
Laboratories, Inc., Skokie, Illinois; William McLean,
Laboratory Director, Professional Testing Laboratories,
Inc., Port Washington, New York; and Ray Schutz,
Consultant, Waupun, Wisconsin

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
Larry C. Muszynski, Principal Engineer, Applied
Research Associates, Inc., Tyndall Airforce Base,
Florida

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

**The Use of Shotcrete to Repair Structures
in a Post-Attack Environment** 5:00
Mark Anderson, Senior Engineer, Applied Research
Associates, Inc., Tyndall Airforce Base, Florida

Monday, March 18, 1991

3:30 PM - _____

5:00 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 - **Sessions:**
NOON ★ Computer Applications in **Independence West**
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 **Independence Center**
Reinforced Concrete for the 21st
Century - Part I

Specification Workshop **Commonwealth**

10:00 AM - _____

11:30 AM _____

NOON- **Contractors' Day Luncheon** **Constitution**
2:00 PM

11:30 AM - _____

1:00 PM _____

1:00 PM - _____

2:00 PM _____

2:00 PM - _____

3:30 PM _____

2:00 PM - **Open Discussion:**
3:00 PM Long Range Plan **Republic A**

2:00 PM - **Sessions/Forum:**
5:00 PM Forum: Architectural Concrete **Commonwealth**
Construction

★ Computer Applications in **Independence West**
Concrete Technology - Part II

Computer-Aided Design of Concrete Shells **Fairfax A**

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

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

3:30 PM - _____

5:00 PM _____

Tuesday, March 19, 1991

5:00 PM - _____
6:30 PM _____
7:30 PM - **Forum:**
10:00 PM ★ Forum: Cutting Edge Research - **Commonwealth**
Where is it Leading Us?

Wednesday, March 20, 1991

7:00 AM - **Educational Breakfast:**
8:30 AM Session Chairman and **Republic A**
Speaker Training Breakfast

7:00 AM - _____
8:30 AM _____

8:30 AM - _____
10:00 AM _____

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

Experimental Techniques: **Independence Center**
Traditional Approaches

★ Lunar Concrete - Part I **Commonwealth**

★ Materials Science and Modeling **Independence East**
in Concrete III: Materials and Processing

The Expanding World of **Independence West**
Shrinkage-Compensating Concrete

10:00 AM - _____
11:30 AM _____

11:30 AM - _____
1:00 PM _____

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

1:00 PM - _____
2:00 PM _____

2:00 PM - _____
3:30 PM _____

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

Open Paper Session **Independence West**

★ Lunar Concrete - Part II **Commonwealth**

★ Materials Science and Modeling **Independence East**
in Concrete IV: Strength and Fracture
Mechanics

Experimental Techniques: **Independence Center**
NDE Approaches

3:30 PM - _____
5:00 PM _____

Wednesday, March 20, 1991

5:00 PM - _____
6:30 PM - _____
6:30 PM - *Concrete Mixer* *Grand Ballroom*
8:00 PM

Thursday, March 21, 1991

8:00 AM - **Awards Breakfast** **Grand Ballroom**
10:00 AM
10:00 AM - **General Session and** **Ballroom A**
1:00 PM **Standards Presentation** **Hynes Convention Center**
1:00 PM - _____
2:00 PM - _____
2:00 PM - _____
3:30 PM - _____
2:00 PM - **Session:**
4:00 PM **★ Fracture Mechanics of Dams** **Independence East**
2:00 PM - **Sessions:**
5:00 PM **Detection of Chloride-Induced** **Fairfax A**
Corrosion and Related Deterioration
Fire Resistance of Materials **Independence West**
and/or Members Made with High-Strength Concrete
Connections Between Precast **Independence Center**
Concrete Elements
2:00 PM - **Session:**
5:30 PM **★ Shotcrete in the 21st Century** **Commonwealth**
3:30 PM - _____
5:00 PM - _____
5:00 PM - _____
6:30 PM - _____

NEW PUBLICATIONS FROM ACI

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

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