

# AMERICAN CONCRETE INSTITUTE



## Fall Convention

September 21-26, 1980

Condado Beach—La Concha Hotels  
and Convention Center  
San Juan, Puerto Rico

## Notes

## Special Events

**Publications Display** . . . in the Grand Hall Foyer all week. See the latest ACI publications now available. Orders are taken at the ACI Registration Desk which is also in the Grand Hall Foyer.

**Coffee Bar** . . . Monday, Tuesday, Thursday, and Friday, 8:00 a.m.-11:00 a.m., and Wednesday, 8:00 a.m.-9:00 a.m., in the Grand Hall Foyer.

**Special Attraction** . . . on Wednesday at the General Session: The premier showing of a color film on nondestructive testing. Produced by CANMET, Department of Energy, Mines and Resources, Canada, the 27-minute film's subject is the in-situ testing of concrete. The techniques discussed include the rebound and penetration methods and the pullout methods including the Danish Lock Test, and CANMET split-sleeve test. This is followed by a description of breakoff and maturity techniques. The history of ultrasonic pulse velocity method is traced with some outstanding shots of the pioneering work at Ontario Hydro, Canada. The film concludes with a sequence on Treat Island, Maine, U.S.A., showing the field use of pulse velocity method. The film has been produced by Scott Films Limited, Ottawa, under the technical direction of V.M. Malhotra of CANMET.

### Education at the Convention:

#### Committee Chairmen's Seminar (by invitation only)

. . . Wednesday, 7:00 a.m.-8:30 a.m., in Ocean C. Sponsored by the Educational Activities Committee and the Technical Activities Committee, the purpose of this seminar is to teach the committee chairman how to handle controversy within his committee. A complimentary continental breakfast will be served at the beginning of this session.

**Student Activities Seminar** . . . Thursday, 7:30 p.m.-10:00 p.m. in Grand Ballroom. Arranged specifically for the engineering student, this seminar will cover student projects and competitions plus a briefing on ACI's technical activities.

**"Concrete Mixer"** . . . Wednesday, 6:30 p.m.-8:00 p.m., at the Dominican Convent Museum. This traditional event will be held in an old Dominican Convent which has been restored and turned into a museum with many interesting exhibits from the early Spanish Colonial days in Puerto Rico. Shuttle buses will start departing at 6:15 p.m. in front of the Convention Center. Please wear your badge and bring your ticket. At the end of the cocktail hour there will be a short floor show by the folkloric group Aryeto. The dances they perform will be done in costume complete with music native to Puerto Rico. The show is presented to us through the kind sponsorship of the Puerto Rican Cement Company, Inc., of San Juan.

**Special Tours** . . . have been planned for the women but are not exclusive to them. Check them out in the back of this booklet. There is something of interest there for everyone!



# PROGRAM

## Fall Convention

September 21-26, 1980  
San Juan, Puerto Rico

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### SUSTAINING MEMBERS OF THE AMERICAN CONCRETE INSTITUTE

Master Builders  
Division of Martin Marietta Corporation  
Cleveland, Ohio

Portland Cement Association  
Skokie, Illinois

Southwestern Portland Cement Company  
Los Angeles, California

Marquette Company  
Nashville, Tennessee

Martin Marietta Cement  
Bethesda, Maryland

W.R. Grace & Company  
Construction Products Division  
Cambridge, Massachusetts

# Schedule

## SUNDAY, SEPTEMBER 21

8:30 a.m.—6:00 p.m.  
Administrative, technical, and educational committee meetings

## MONDAY, SEPTEMBER 22

8:30 a.m.—10:00 p.m.  
Administrative, technical, and educational committee meetings

2:00 p.m.—5:00 p.m.  
Peculiarities of Concrete Construction in Puerto Rico (ACI Puerto Rico Chapter)

## TUESDAY, SEPTEMBER 23

8:30 a.m.—10:00 p.m.  
Administrative, technical, and educational committee meetings

## WEDNESDAY, SEPTEMBER 24

9:00 a.m.—11:00 a.m.  
General Session

11:00 a.m.—12:00 noon  
Standards Presentation

2:00 p.m.—5:00 p.m.  
Recent Research in Fatigue of Concrete Structures (1st of 2 sessions) (Committee 215)

2:00 p.m.—5:00 p.m.  
Design of Slabs on Grade (Committee 360)

2:00 p.m.—5:00 p.m.  
Symposium on Polymers in Concrete (1st of 2 sessions) (Committee 548)

2:00 p.m.—6:00 p.m.  
Technical and administrative committee meetings

6:30 p.m.—8:00 p.m.  
"Concrete Mixer" at the Dominican Convent Museum

## THURSDAY, SEPTEMBER 25

8:30 a.m.—10:00 p.m.  
Technical committee meetings

9:00 a.m.—12:00 noon  
Recent Research in Fatigue of Concrete Structures (2nd of 2 sessions) (Committee 215)

9:00 a.m.—12:00 noon  
Symposium on Polymers in Concrete (2nd of 2 sessions) (Committee 548)

9:00 a.m.—5:00 p.m.  
International Symposium on Fire Safety of Concrete Structures (Committee 216)

2:00 p.m.—5:00 p.m.  
Research in Progress (Committee 115)

2:00 p.m.—5:00 p.m.  
Design of Tall Buildings to Resist Wind and Earthquake (Committee 442)

7:30 p.m.—10:00 p.m.  
Forum: How Safe Are the Seismic Provisions for Concrete Structures in Building Codes (Committees 114 and 442)

7:30 p.m.—10:00 p.m.  
Student Activities Program (Committee E-801)

## FRIDAY, SEPTEMBER 26

8:30 a.m.—12:30 p.m.  
Technical committee meetings

9:00 a.m.—12:00 noon  
Concrete in Marine Environments

9:00 a.m.—12:00 noon  
Design Concepts for Splices and Development of Reinforcement (Committee 408)

9:00 a.m.—12:00 noon  
Dynamic Modeling of Concrete Structures (Committee 444)

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## Registration

The ACI staff is eager to answer any questions you may have pertaining to the convention. The registration desk is open to serve you Sunday, September 21, 1:00 p.m.-5:00 p.m.; Monday, September 22, 7:30 a.m.-5:00 p.m.; Tuesday through Thursday, September 23-25, 8:00 a.m.-5:00 p.m.; Friday, September 26, 8:00 a.m.-10:30 a.m.

### Fees:

Member	.....\$70
NonMember	..... 85
One-day, Member	..... 30
One-day, NonMember	..... 35
Friday morning only	..... 20
Students	..... Free

Registration fees cover attendance at all ACI technical and educational committee meetings, general session, symposia, and the Concrete Mixer.

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## Badges

Wear your badge on the right side at all times. (In shaking hands the eyes normally fall at shoulder level on the right side of the individual being greeted.)

# Committee Meetings

To ease the problem of finding your committee rooms within the complex, please remember the following:

All numbered rooms (for example, B-1, M-5) plus the East and West Ballrooms are in the Convention Center. The B rooms are on the 3rd floor with the two ballrooms, and the M rooms are on the mezzanine.

All named rooms with the exception of the three Ocean rooms are in the Condado Beach Hotel.

Ocean A, B, and C are in the La Concha Hotel.

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

## COMMITTEE MEETING ROOM

### SUNDAY

#### SEPTEMBER 21 8:30 a.m.-12:30 p.m.

- Technical Activities Committee Subgroup Room B-3
- Technical Activities Committee Subgroup Room B-2
- Technical Activities Committee Subgroup Room B-1

#### 2:00 p.m.-4:00 p.m.

- Technical Activities Committee Room B-1
- 533 Precast Panels Room B-4

#### 3:00 p.m.-7:00 p.m.

- E-902 Certification Committee Room B-3

#### 4:00 p.m.-6:00 p.m.

- Technical Activities Committee Room B-1

### MONDAY

#### SEPTEMBER 22 8:30 a.m.-10:30 a.m.

- Educational Activities Committee Room B-4
- Technical Activities Committee Room B-1
- Construction Review Committee Room M-5
- 211 Subcommittee 7, Proportioning Mass Concrete Room B-3
- 301 Specifications for Structural Concrete Ocean B
- 303 Architectural Concrete Salon Gobernador

#### 318 Standard Building Code Ocean C

- 343 Concrete Bridge Design Patio Del Mar
- 349 Working Group on Embedments Room M-2
- 362 Parking Structures West Ballroom
- 435 Deflection of Concrete Building Structures Patio Del Sol
- 437 Strength Evaluation of Existing Concrete Patio Del Fauno
- 506 Shotcreting East Ballroom
- 530 Masonry Structures (See Committee 531)
- 531 Concrete Masonry Structures Room M-3
- E-601 Seminars and Workshops Room M-1
- E-901 Scholarship Committee Mirror Room

#### 10:30 a.m.-12:30 p.m.

- Educational Activities Committee Room B-4
- Technical Activities Committee Room B-1
- International Activities Committee Room B-2

## MONDAY (continued)

(continued) 10:30 a.m.-12:30 p.m.

- Construction Review Committee Room M-5
- 104 Notation Mirror Room
- 201 Durability of Concrete Patio Del Fauno
- 207 Mass Concrete Patio Del Sol
- 301 Specifications for Structural Concrete Ocean B
- 303 Architectural Concrete Salon Gobernador
- 318 Standard Building Code Ocean C
- 343 Concrete Bridge Design Patio Del Mar
- 349 Working Group on Embedments Room M-2
- 362 Parking Structures West Ballroom
- 363 High Strength Concrete Room B-3
- 506 Shotcreting East Ballroom
- 516 High Pressure Steam Curing Ocean A
- 530 Masonry Structures (See Committee 531)
- 531 Concrete Masonry Structures Room M-3
- 544 Fiber Reinforced Concrete Grand Ballroom
- E-601 Seminars and Workshops Room M-1

#### 2:00 p.m.-4:00 p.m.

- Educational Activities Committee Room B-4
- Board Committee on Publications Room M-5
- 214 Evaluation of Results of Tests Used to Determine Strength of Concrete Room B-3
- 223 Expansive Cement Concretes Room B-2
- 308 Curing Concrete Room M-1
- 315 Details of Concrete Reinforcement Salon Gobernador
- 318 Standard Building Code Ocean C
- 349 Working Group on Materials Ocean A
- 349 Working Group on Embedments Room M-2
- 349 Working Group on Impact/Impulse Ocean B
- 362 Parking Structures West Ballroom
- 439 Steel Reinforcement Patio Del Mar
- 506 Shotcreting Patio Del Fauno
- 530 Masonry Structures (See Committee 531)
- 531 Concrete Masonry Structures Room M-3
- 544 Fiber Reinforced Concrete Grand Ballroom
- E-703 Concrete Construction Practices Room B-1

#### 2:00 p.m.-5:00 p.m.

### PECULIARITIES OF CONCRETE CONSTRUCTION IN PUERTO RICO

East Ballroom

#### 4:00 p.m.-6:00 p.m.

- Educational Activities Committee Room B-4
- Construction Liaison Committee Room B-5
- 214 Evaluation of Results of Tests Used to Determine the Strength of Concrete Room B-3
- 223 Expansive Cement Concretes Room B-2
- 315 Details of Concrete Reinforcement Salon Gobernador
- 318 Standard Building Code Ocean C

SEE FLOOR PLANS ON PAGES 22-26

## MONDAY (continued)

349	Working Group on Materials	Ocean A
349	Working Group on Embedments	Room M-2
349	Working Group on Impact/Impulse	Ocean B
362	Parking Structures	West Ballroom
439	Steel Reinforcement	Patio Del Mar
506	Shotcreting	Patio Del Fauno
530	Masonry Structures (See Committee 531)	
531	Concrete Masonry Structures	Room M-3
544	Fiber Reinforced Concrete	Grand Ballroom
E-702	Designing Concrete Structures	Room M-1
<b>7:30 p.m.-9:30 p.m.</b>		
—	Board Committee on Metrication	Room B-4
302	Construction of Concrete Floors	Room B-2
E-801	Student Concrete Projects	Room M-2

## TUESDAY

### SEPTEMBER 23

<b>8:30 a.m.-10:30 a.m.</b>		
—	Planning Committee	Room B-1
211	Proportioning Concrete Mixes	Grand Ballroom
304	Measuring, Mixing, Transporting and Placing Concrete	Room B-2
311	Inspection of Concrete	West Ballroom
318	Subcommittee 2, Concrete Quality and Construction	Room B-3
318	Subcommittee 5, Serviceability	Patio Del Sol
318	Subcommittee 6, Flexure and Axial Loads	Patio Del Fauno
318	Subcommittee 8, Two-Way Slabs	Patio Del Mar
344	Circular Prestressed Concrete Structures	Room M-1
345	Concrete Bridge Construction and Maintenance	Room M-2
349	General	Room M-4
349	Working Group on Design	Room M-5
349	Working Group on Materials	Ocean A
349	Working Group on Impact/Impulse	Ocean B
355	Anchorage to Concrete	Room B-4
423	Prestressed Concrete	Salon Gobernador
503	Adhesives for Concrete	East Ballroom
530	Masonry Structures (See Committee 531)	
531	Concrete Masonry Structures	Room M-3
E-701	Materials for Concrete Construction	Ocean C

## LOCATION OF MEETING ROOMS

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Ocean A, B, and C are in the La Concha Hotel.

## TUESDAY (continued)

<b>10:30 a.m.-12:30 p.m.</b>		
—	Planning Committee	Room B-1
221	Aggregates	Room B-4
311	Inspection of Concrete	West Ballroom
318	Subcommittee 2, Concrete Quality and Construction Requirements	Room B-3
318	Subcommittee 5, Serviceability	Patio Del Sol
318	Subcommittee 6, Flexure and Axial Loads	Patio Del Fauno
318	Subcommittee 8, Two-Way Slabs	Patio Del Mar
344	Circular Prestressed Concrete Structures	Room M-1
349	General	Room M-4
349	Working Group on Design	Room M-5
349	Working Group on Materials	Ocean A
349	Working Group on Impact/Impulse	Ocean B
423	Prestressed Concrete	Salon Gobernador
441	Reinforced Concrete Columns	Room M-2
503	Adhesives for Concrete	East Ballroom
517	Accelerated Curing of Concrete at Atmospheric Pressure	Grand Ballroom
530	Masonry Structures (See Committee 531)	
531	Concrete Masonry Structures	Room M-3
547	Refractory Concrete	Ocean C
<b>2:00 p.m.-4:00 p.m.</b>		
—	Board of Direction	Patio Del Sol
—	Educational Activities Committee	Room B-4
117	Tolerances	West Ballroom
121	Quality Assurance Systems	Room B-1
212	Admixtures	Room M-5
224	Cracking	Patio Del Mar
309	Consolidation of Concrete	Room M-4
318	Subcommittee 3, Details, Developments, and Splices	Mirror Room
318	Subcommittee 9, Prestressed, Precast and Composite Concrete	Patio Del Fauno
318	Subcommittee 10, Seismic Provisions	Salon Gobernador
344	Circular Prestressed Concrete Structures	Room M-1
347	Formwork for Concrete	Room M-2
348	Subcommittee E, Safety Evaluation of Existing Structures	Room B-3
349	Concrete Nuclear Structures	Room B-2
360	Design of Slabs on Grade	East Ballroom
517	Accelerated Curing of Concrete at Atmospheric Pressure	Grand Ballroom
530	Masonry Structures (See Committee 531)	
531	Concrete Masonry Structures	Room M-3
548	Polymers in Concrete	Ocean C

SEE FLOOR PLANS ON PAGES 22-26

**TUESDAY (continued)**

	<b>4:00 p.m.-6:00 p.m.</b>	
— Board of Direction	Patio Del Sol	
— Educational Activities Committee	Room B-4	
115 Current Research	Grand Ballroom	
117 Tolerances	West Ballroom	
121 Quality Assurance Systems	Room B-1	
224 Cracking	Patio Del Mar	
305 Hot Weather Concreting	Ocean B	
309 Consolidation of Concrete	Room M-4	
<b>318 Subcommittee 3, Details, Development, and Splices</b>	<b>Mirror Room</b>	
<b>318 Subcommittee 9, Prestressed, Precast and Composite Concrete</b>	<b>Patio Del Fauno</b>	
<b>318 Subcommittee 10, Seismic Provisions</b>	<b>Salon Gobernador</b>	
344 Circular Prestressed Concrete Structures	Room M-1	
347 Formwork for Concrete	Room M-2	
349 Concrete Nuclear Structures	Room B-2	
360 Design of Slabs on Grade	East Ballroom	
504 Joint Sealants	Room M-5	
530 Masonry Structures (See Committee 531)		
531 Concrete Masonry Structures	Room M-3	
548 Polymers in Concrete	Ocean C	
549 Ferrocement	Ocean A	

**7:30 p.m.-9:30 p.m.**

— Institute and Industry Advancement Committee	Room M-5
122 Energy Conservation	Room M-1
215 Fatigue of Concrete	Room B-4
318 Subcommittee 12, Performance Code Concept	Room B-3
318 Task Group on Liaison with Other Materials Groups	Room B-2
318 Task Group on Metrication	Room B-1
318 Task Group on Plain Concrete	Room M-3
444 Models of Concrete Structures	Room M-4

**WEDNESDAY****SEPTEMBER 24****8:30 a.m.-12:30 p.m.**

318 Subcommittee 1, General	Room B-4
318 Subcommittee 4, Analysis and Safety	Room M-4
318 Subcommittee 7, Shear and Torsion	Room M-5

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Ocean A, B, and C are in the La Concha Hotel.

**WEDNESDAY (continued)****9:00 a.m.-11:00 a.m.****GENERAL SESSION** West Ballroom**11:00 a.m.-12:00 noon****STANDARDS PRESENTATION** East Ballroom**1:30 p.m.-5:30 p.m.**

— Convention Committee Ocean A

**2:00 p.m.-4:00 p.m.**

— Membership Recruitment Committee Room M-2

— Specifications Review Committee Mirror Room

114 Research and Development Room B-4

118 Use of Computers Ocean B

306 Cold Weather Concreting Room M-4

**318 Standard Building Code** Ocean C

348 Structural Safety Patio del Mar

358 Concrete Guideways Room M-1

442 Response of Buildings to Lateral Forces Room B-2

445 Shear and Torsion Room M-5

**2:00 p.m.-5:00 p.m.****RECENT RESEARCH IN FATIGUE OF CONCRETE****STRUCTURES** (first session) East Ballroom**DESIGN OF SLABS ON GRADE** Grand Ballroom**SYMPOSIUM ON POLYMERS IN CONCRETE**

(first session) West Ballroom

**4:00 p.m.-6:00 p.m.**

— Membership Recruitment Committee Room M-2

116 Nomenclature Room M-3

216 Fire Resistance and Fire Protection of Structures Room B-1

222 Corrosion of Metals in Concrete Room B-4

306 Cold Weather Concreting Room M-4

**318 Standard Building Code** Ocean C

346 Cast-In-Place Pipe Room B-3

348 Structural Safety Patio del Mar

358 Concrete Guideways Room M-1

442 Response of Buildings to Lateral Forces Room B-2

445 Shear and Torsion Room M-5

523 Insulating and Cellular Concretes Ocean B

**THURSDAY****SEPTEMBER 25****8:30 a.m.-10:30 a.m.**

— Chapter Activities Committee Room M-1

209 Creep and Shrinkage in Concrete Room M-5

225 Hydraulic Cements Room M-2

340 Strength Design Handbook Room B-4

352 Joints and Connections in Monolithic Concrete Structures Room B-1

428 Inelastic Behavior of Reinforced Concrete Structures Room B-2

515 Coatings for Concrete Room M-4

**SEE FLOOR PLANS ON PAGES 22-26**

## THURSDAY (continued)

9:00 a.m.-12:00 noon

**RECENT RESEARCH IN FATIGUE OF CONCRETE STRUCTURES** (second session) East Ballroom  
**INTERNATIONAL SYMPOSIUM ON FIRE SAFETY OF CONCRETE STRUCTURES** (first session) Grand Ballroom  
**SYMPOSIUM ON POLYMERS IN CONCRETE** (second session) West Ballroom  
Board of Direction Patio Del Sol

10:30 a.m.-12:30 p.m.

210 Erosion of Concrete in Hydraulic Structures Room M-1  
225 Hydraulic Cements Room M-2  
340 Strength Design Handbook Room B-4  
352 Joints and Connections in Monolithic Concrete Structures Room B-1  
428 Inelastic Behavior of Reinforced Concrete Structures Room B-2  
515 Coatings for Concrete Room M-4

2:00 p.m.-4:00 p.m.

336 Combined Footings and Pier Foundations Room B-2  
408 Bond and Development of Reinforcement Room B-1  
515 Coatings for Concrete Room M-4  
546 Repair of Concrete Room M-1

2:00 p.m.-5:00 p.m.

**RESEARCH ON PLAIN AND REINFORCED CONCRETE** East Ballroom

**INTERNATIONAL SYMPOSIUM ON FIRE SAFETY OF CONCRETE STRUCTURES** (second session) Grand Ballroom

**DESIGN OF TALL BUILDINGS TO RESIST WIND AND EARTHQUAKE** West Ballroom

4:00 p.m.-6:00 p.m.

408 Bond and Development of Reinforcement Room B-1  
532 Concrete Masonry Room B-4

7:30 p.m.-10:00 p.m.

**FORUM: HOW SAFE ARE THE SEISMIC PROVISIONS FOR CONCRETE STRUCTURES IN BUILDING CODES** East Ballroom  
**STUDENT ACTIVITIES PROGRAM** Grand Ballroom

## FRIDAY

SEPTEMBER 26

9:00 a.m.-12:00 noon

**CONCRETE IN MARINE ENVIRONMENTS** Grand Ballroom  
**DESIGN CONCEPTS FOR SPLICES AND DEVELOPMENT OF REINFORCEMENT** East Ballroom  
**DYNAMIC MODELING OF CONCRETE STRUCTURES** West Ballroom

# Puerto Rico Convention Committee

Carlos A. Lazaro, General Chairman  
Teresa Lazaro  
Jorge Hidalgo  
Ilia Hidalgo  
Emiliano H. Ruiz  
Margarita Ruiz



## ACI Puerto Rico Chapter Officers

### President

Jorge Hidalgo

### Vice-President

Juan H. Gracia

### Secretary-Treasurer

Jose R. Alejandro

### Past President and Director

Emiliano H. Ruiz

### Directors

Carlos A. Lazaro  
Ignacio Martin  
Melville E. Prior



MONDAY, SEPTEMBER 22

2:00 p.m.-5:00 p.m.

East Ballroom

## PECULIARITIES OF CONCRETE CONSTRUCTION IN PUERTO RICO

sponsored by the Puerto Rico Chapter, ACI

**Session Chairman:** Emiliano H. Ruiz, Office of Emiliano H. Ruiz, civil engineers and structural consultants, Hato Rey, Puerto Rico

### Peculiarities of Hot Weather Concreting in Puerto Rico

Eduardo A. Oliver, vice-president in charge of sales and operations, Ready-Mix Concrete, Inc., Carolina, Puerto Rico

### Peculiarities of the Structural Behavior of Mass-Produced, Cast-in-Place Dwellings in Puerto Rico

Ignacio Martin, partner, Capacete, Martin and Associates, San Juan, Puerto Rico

### Peculiarities of the Construction of Mass-Produced, Cast-in-Place Dwellings in Puerto Rico

Rafael Torrens and Agustin Mujica, Levitt Homes of Puerto Rico, Inc., Catano, Puerto Rico

### The Fuentes Precast Concrete Pile

Gabriel Fuentes, chairman, Fuentes Concrete Pile Company, Bayamon, Puerto Rico

### Concrete in Architecture—Our Experience in Puerto Rico

Thomas Marvel, Torres, Beauchamp and Marvel, Hato Rey, Puerto Rico

WEDNESDAY, SEPTEMBER 24

7:00 a.m.-8:30 a.m.

Ocean C

## CHAIRMEN TRAINING SESSION (by Invitation Only)

sponsored by the Educational Activities Committee and the Technical Activities Committee

**Topic:** How to Deal With Conflict in your Committee Meetings

Many times, a conflict will stifle a committee's effectiveness and bog down productivity. The objective of this session is to demonstrate various methods of handling strong differences of opinion by drawing out the dispute and resolving conflict to a fruitful conclusion.

**Moderator:** Harold (Bud) Gilley, director of education, American Concrete Institute, Detroit, Michigan

## PROGRAM

### Complimentary Continental Breakfast

#### Opening Comments

Edwin G. Hedstrom, chairman, Educational Activities Committee, and manager of special products, Ideal Basic Industries, Denver, Colorado

#### Value of Conflict

Edward O. Pfrang, chairman, Technical Activities Committee, and chief, Structures, Materials & Safety Division, National Bureau of Standards, Washington, D.C.

#### Focusing In On and Drawing Out Conflict in ACI Committees

John F. McLaughlin, Past President, ACI, and assistant dean of engineering, Purdue University, West Lafayette, Indiana

#### Formal Resolution of Conflict

Robert E. Philleo, Past President, ACI; Chairman, Information Services Committee; and chief, Structures Branch Office, Chief of Engineers, Washington, D.C.

#### Open Discussion

#### Closing Comments and Adjournment

Samuel J. Henry, director of engineering, American Concrete Institute, Detroit, Michigan

WEDNESDAY, SEPTEMBER 24

11:00 a.m.-12:00 noon

East Ballroom

## STANDARDS PRESENTATION

**Moderator:** Charles J. Pankow, President, ACI, and president, treasurer, and CEO, Charles Pankow, Inc., Altadena, California

**Presentation of Proposed ACI Standard: "Tolerances for Concrete Construction and Materials"**

A. Ernest Fisher III, chairman, ACI Committee 117, and market analyst, Bethlehem Steel Corporation, Bethlehem, Pennsylvania

**Presentation of Proposed Revision of ACI 211.2-69:**

**"Standard Practice for Selecting Proportions for Structural Lightweight Concrete"**

William W. Hotaling, Jr., member, ACI Committee 211, and director of engineering services, National Sand and Gravel Association, Silver Spring, Maryland

**Presentation of Proposed Revision of ACI 346-70: "Specifications for Cast-in-Place Nonreinforced Concrete Pipe"**

Donald L. Weesner, chairman, ACI Committee 346, and assistant general manager, Salt River Project, Phoenix, Arizona



WEDNESDAY, SEPTEMBER 24

2:00 p.m.-5:00 p.m.

East Ballroom

## RECENT RESEARCH IN FATIGUE OF CONCRETE STRUCTURES

sponsored by ACI Committee 215

**Session Chairman:** S.P. Shah, chairman, ACI Committee 215, and professor of civil engineering, Department of Materials Engineering, University of Illinois at Chicago Circle, Chicago, Illinois

### Session I

**Corrosion Fatigue in Concrete for Marine Applications**

Peter D. Arthur, senior lecturer in civil engineering; J.C. Earl and T. Hodgkiss, lecturers in mechanical engineering, Department of Mechanical Engineering, University of Glasgow, Glasgow, Scotland

**Analysis of Reinforced Concrete Beam for Fatigue Loading: Serviceability**

P. Balaguru, assistant professor of civil engineering, Rutgers University, Piscataway, New Jersey, and S.P. Shah, professor of civil engineering, University of Illinois at Chicago Circle, Chicago, Illinois

**Long-Time Fatigue Properties of Grade 60 Reinforcing Steel**

B.G. Rabbat, senior structural engineer, Structural Development Department; W.G. Corley, divisional director, Engineering Development Division, Portland Cement Association, Skokie, Illinois; T. Helgason, associate professor of civil engineering, University of Iceland, Reykjavik, Iceland; J.M. Hanson, president, Wiss, Janney, Elstner and Associates, Inc., Northbrook, Illinois

**Crack Growth and Fracture in Plain Concrete—Static Versus Fatigue Loading**

Stuart E. Swartz, professor of civil engineering; James Huang, graduate research assistant; and K.K. Hu, associate professor of civil engineering, Kansas State University, Manhattan, Kansas

**Fatigue of Concrete by Constant and Variable Amplitude Loading**

Jan Ove Holmen, research engineer, The Norwegian Institute of Technology, Trondheim, Norway

**The Effects of Air Content, Water-Cement Ratio and Aggregate Type on the Flexural Fatigue Strength of Plain Concrete**

F. Wayne Klaiber and Dah-Yinn Lee, professors of civil engineering, Iowa State University, Ames, Iowa

# Board of Direction

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P.O. Box 19150

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WEDNESDAY, SEPTEMBER 24

9:00 a.m. - 11:00 a.m.

West Ballroom

## GENERAL SESSION

**Session Chairman:** Jorge Hidalgo, President, Puerto Rico Chapter, ACI, and partner, Gonzalez-Hidalgo, San Juan, Puerto Rico

### Welcome

Jorge Hidalgo, session chairman

### Raymond E. Davis Lecture: Making the Most of Models

Roy E. Rowe, director-general, Cement and Concrete Association, Wexham Springs, Slough, England

### Keynote Address: The Report of the National Materials Advisory Board's Committee on the Status of Cement and Concrete Research and Development in the United States

Della Roy, professor of materials science, Materials Research Laboratory, Pennsylvania State University, University Park, Pennsylvania; and Jan Skalny, associate director, Martin Marietta Laboratories, Baltimore, Maryland

### Film: Nondestructive Testing of Concrete

Produced by CANMET, Department of Energy, Mines and Resources, Ottawa, Ontario, Canada

### ACI Business\*

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\*The presentation and discussion of Standards will be held in a separate room at the conclusion of the Business Session. Please refer to Wednesday, 11:00 a.m.



# Floor Plans

LA CONCHA  
HOTEL  
PAGE 26



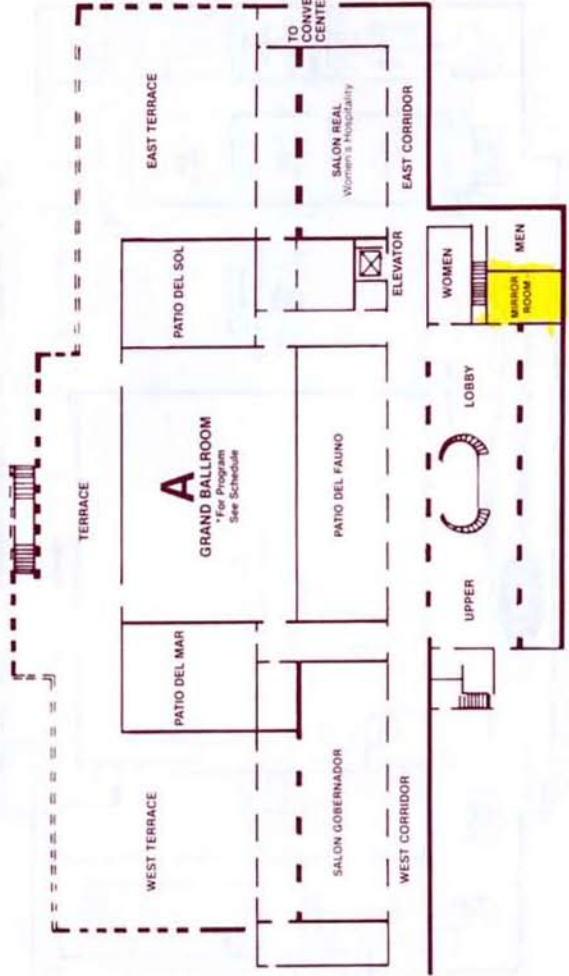
CONVENTION CENTER  
3RD FLOOR  
PAGE 24

CONVENTION CENTER  
MEZZANINE  
PAGE 25

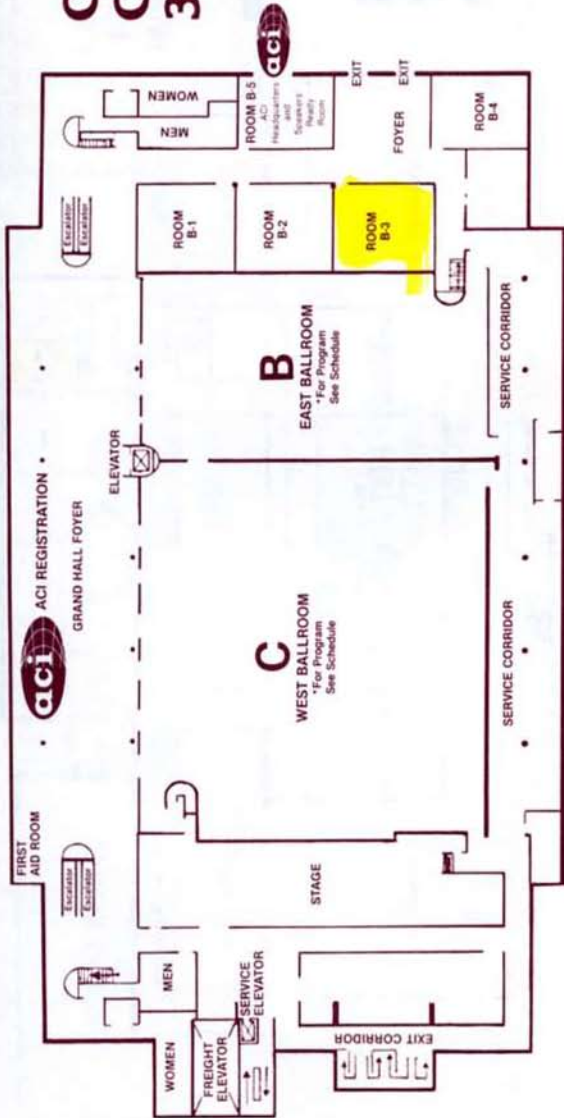
CONDADO BEACH  
HOTEL  
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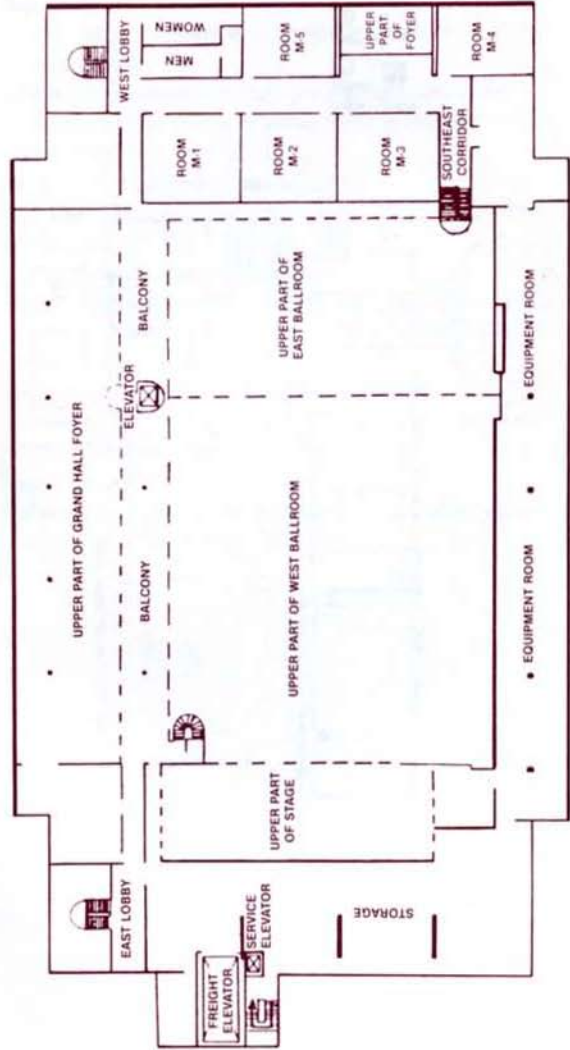
## Condado Beach Hotel



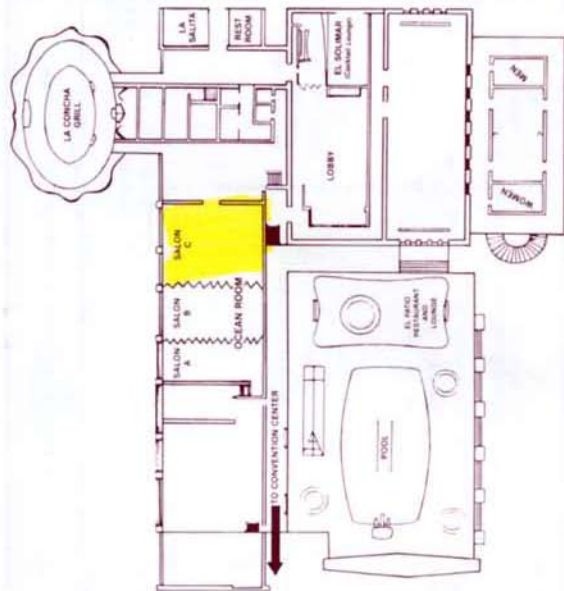
# Convention Center— 3rd Floor



# Convention Center— Mezzanine



# La Concha Hotel



WEDNESDAY, SEPTEMBER 24

2:00 p.m.-5:00 p.m.

Grand Ballroom

## DESIGN OF SLABS ON GRADE

sponsored by ACI Committee 360

**Session Chairman:** A.F. Shaikh, chairman, ACI Committee 360, and professor, Department of Civil Engineering, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin

### Introduction

A.F. Shaikh, session chairman

### State of the Art

Boyd C. Ringo, professor of civil engineering, University of Cincinnati, Cincinnati, Ohio

### Design Considerations—Unreinforced and Reinforced Slabs

Robert D. Johnson, senior structural engineer, Eastman Kodak Company, Penfield, New York

### Design of Post-Tensioned Slabs on Ground

Cliff Freyermuth, executive director, Post-Tensioning Institute, Phoenix, Arizona

### Use of Shrinkage Compensating Elements

Mark W. Hoffman, chief structural engineer, Dalton, Dalton, Little & Newport, Cleveland, Ohio; and Robert J. Gulyas, Maximet Division, Set Products, Inc., Macedonia, Ohio

### Perspective of Revised ACI Committee 302 Report

William S. Phelan, vice-president, marketing, The Euclid Chemical Company, Woodbridge, New Jersey

### Panel Discussion

Robert F. Ytterberg, panel moderator, and president, Kalman Floor Company, White Plains, New York

WEDNESDAY, SEPTEMBER 24

2:00 p.m.-5:00 p.m.

West Ballroom

## SYMPOSIUM ON POLYMERS IN CONCRETE

sponsored by ACI Committee 548

**Session Chairman:** L.E. Kukacka, leader, Geothermal Materials Group, Department of Energy and Environment, Brookhaven National Laboratory, Upton, New York

### Session I

#### Introduction

L.E. Kukacka, symposium chairman

#### Overview: Current Research on Polymer-Concrete Materials and Future Needs

John A. Manson, professor, Materials Research Center, Lehigh University, Bethlehem, Pennsylvania

#### The Use of Concrete Polymer Materials in the Transportation Industry

Jack J. Fontana, associate chemist, Process Sciences Division, Department of Energy and Environment, Brookhaven National Laboratory, Upton, New York; and John Bartholomew, Office of Development, Federal Highway Administration, Washington, D.C.

#### Applications of Concrete Polymer Materials in Hydrotechnical Construction

John M. Scanlon, acting chief, Concrete Technology Division, Structures Laboratory, U.S. Army Waterways Experiment Station, Vicksburg, Mississippi

#### Polymer Concretes and the Electrical Power Industry

E. Robert Perry, director, Transmission Department, Electric Power Research Institute, Palo Alto, California

#### A New, Novel Well-Cementing Polymer-Concrete Composite

Arkady Zeldin, N. Carciello, and Jack J. Fontana, Process Sciences Division, Department of Energy and Environment, Brookhaven National Laboratory, Upton, New York

#### Research in Progress: Rapid All-Weather Pavement Repair with Polymer Concrete

Michael T. McNerney, research engineer, United States Air Force Engineering and Services Center, Tyndall Air Force Base, Florida

THURSDAY, SEPTEMBER 25

9:00 a.m.-12:00 noon

East Ballroom

## RECENT RESEARCH IN FATIGUE OF CONCRETE STRUCTURES

sponsored by ACI Committee 215

**Session Chairman:** Basile G. Rabbat, senior structural engineer, Structural Development Department, Portland Cement Association, Skokie, Illinois

### Session II

#### Deflection and Cracking of Reinforced Concrete Under Repeated Loading and Fatigue

J.M. Lovegrove, lecturer; and A.S. Salah El Din, research fellow, Department of Civil Engineering, The University of Southampton, Southampton, United Kingdom

#### Fatigue in Partially Prestressed Concrete Beams

A.E. Naaman, associate professor, Department of Materials Engineering, University of Illinois at Chicago Circle, Chicago, Illinois

#### Fatigue Tests of Spliced Reinforcement in Concrete Beams

E.W. Bennett, reader in civil engineering, University of Leeds, Leeds, England

#### Fatigue of Plain Concrete Subjected Between Tension and Compression-Changing Stresses

Ralejs Tepfers, associate professor of building materials and building technology, Chalmers University of Technology, Goteborg, Sweden

#### Fatigue of Plain Concrete Subjected to Biaxial-Cyclic Loading

Leonard A. Traina, professor, Department of Civil Engineering, New Mexico State University, Las Cruces, New Mexico; and A.A. Jeragh, head, Government of Kuwait Research Institute, Al-Faiha, Kuwait

#### Dynamic Response of Reinforced Concrete Flexural Members

Alfred G. Bishara, professor of civil engineering, Ohio State University, Columbus, Ohio

THURSDAY, SEPTEMBER 25

9:00 a.m. - 12:00 noon

West Ballroom

## SYMPOSIUM ON POLYMERS IN CONCRETE

sponsored by ACI Committee 548

**Session Chairman:** George C. Hoff, chief, Materials and Concrete Analysis Group, Structures Laboratory, U.S. Army Waterways Experiment Station, Vicksburg, Mississippi

### Session II

#### Introduction

L.E. Kukacka, leader, Geothermal Materials Group, Department of Energy and Environment, Brookhaven National Laboratory, Upton, New York

#### The Use of Polymers to Repair Concrete in Marine and Hydraulic Environments

Ernest K. Schrader, materials engineer, U.S. Army Corps of Engineers, Walla Walla, Washington

#### A Performance History of Latex Modified Concrete Overlays

L.A. Kuhlman, research specialist, Dow Chemical Company, Larkin Laboratory, Midland, Michigan

#### Polymer Concretes for Electrical Applications

Rosalía Torres Becerra, investigator, Instituto de Investigaciones Electricas, Cuernavaca, Morelos, Mexico

#### Epoxy Modified Portland Cement Concrete

Samuel H. Christie III, product planning manager; Ronald R. McClain, senior development chemist; and James H. Melloan, senior market development specialist, Celanese Plastics and Specialties Company, Louisville, Kentucky

#### An Evaluation of the Bond Durability of Overlays of Low Slump and Latex Modified Concrete to Polymer Impregnated Concrete

Richard E. Weyers, instructor; and P.D. Cady, professor, Department of Civil Engineering; P.R. Blankenhorn, associate professor of wood technology; and L.R. Stover, research assistant, School of Forest Resources, Pennsylvania State University, University Park, Pennsylvania

#### Evaluation of Performance of Mold-Releasing Agents for Polyester Resin Concrete (or Polymer Concrete)

Yoshihiko Ohama and Katsunori Demura, Nihon University, Fukushima-Ken, Japan

THURSDAY, SEPTEMBER 25

9:00 a.m. - 12:00 noon

Grand Ballroom

## INTERNATIONAL SYMPOSIUM ON FIRE SAFETY OF CONCRETE STRUCTURES

sponsored by ACI Committee 216

**Session Chairman:** Melvin S. Abrams, chairman, ACI Committee 216, and manager, Fire Research Section, Portland Cement Association, Skokie, Illinois

### Session I

#### Introduction

Melvin S. Abrams, session chairman

#### Experiences From Evaluating Fire-Damaged Structures

Armand H. Gustaferrero, consulting engineer, The Consulting Engineers Group, Inc., Glenview, Illinois

#### An Underground Shopping Center Fire and After-Fire Repair Project

Ersin Arioglu, Koksal Anadol and Ali Candogan, Yapi Candogan Camlica, Istanbul, Turkey

#### Can Extremely Green Concrete Withstand Fire with Minor Damage?

Gerhard T. Suter, professor, Department of Engineering, Carleton University, Ottawa, Ontario, Canada

#### Thermoluminescence: A Comparison With the Residual Strength of Various Concretes

L.M. Smith, research assistant; and F. Placido, lecturer, Paisley College of Technology, Paisley, Scotland

#### Mechanical and Physical Properties of Concrete to Temperatures 620°C

C.B. Oland, Oak Ridge National Laboratory, Oak Ridge, Tennessee; Dan Jay Naus, Knoxville, Tennessee; G.C. Robinson; Harold Cruz Hirth, Berkeley, California; David Pirtz, professor, and Milos Polivka, University of California, Berkeley, California

#### The Spalling of Normalweight and Lightweight Concrete Exposed to Fire

W.J. Copier, head, Structural Building Division, Amsterdam Municipal Works, Amsterdam, The Netherlands



## INTERNATIONAL SYMPOSIUM ON FIRE SAFETY OF CONCRETE STRUCTURES

sponsored by ACI Committee 216

**Session Chairman:** Boris Bresler, senior consultant, Wiss, Janney, Elstner & Associates, Inc., Emeryville, California

### Session II

#### Introduction

Boris Bresler, session chairman

#### Fire Severity: Basis of Fire Safety Design

Tibor Z. Harmathy, head, Fire Section, National Research Council, Ottawa, Ontario, Canada

#### Structural Fire Protection Levels for Industrial Buildings

Ulrich Schneider, Technical University of Braunschweig, Institut für Baustoffe, Massivbau und Brandschutz, Braunschweig, West Germany; Heinrich Bub, president; and Marita Kersken-Bradley, engineer, Institut für Bautechnik, West Berlin, Germany

#### Materials-Dominated Aspects of Design for Structural Fire Resistance of Concrete Structures

John W. Dougill, professor of engineering science, University of London, King's College, London, England

#### Fire Response of Prestressed Concrete Members

Boris Bresler and R. Iding, Wiss, Janney, Elstner & Associates, Inc., Emeryville, California

#### Simulation of Realistic Thermal Restraint During Fire Tests of Floor and Roof Assemblies

T.D. Lin, senior research engineer, and Melvin S. Abrams, director, Fire Research Department, Portland Cement Association, Skokie, Illinois

#### The Fire Engineering Design of the New Reichsbrücke in Vienna

Ataman Haksever, scientific collaborator; and Karl Kordina, professor, Institut für Baustoffe Massivbau und Brandschutz, Braunschweig, West Germany

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## RESEARCH ON PLAIN AND REINFORCED CONCRETE

sponsored by ACI Committee 115

*(Brief and confidential reports)*

**Session Chairman:** James T. Dikeou, chairman, ACI Committee 115, and president, Dikeou Associates, Englewood, Colorado

**Secretary:** Charles F. Scholer, secretary, ACI Committee 115, and professor, Department of Civil Engineering, Purdue University, West Lafayette, Indiana

### The Absorption of Aggregate and Its Effect on the Strength of Concrete

Kenneth R. Lauer, professor of civil engineering, University of Notre Dame, Notre Dame, Indiana; and Joseph O. Cooler, engineer, Bendix Corporation, South Bend, Indiana

### Tests of Ductile Behavior of Lightweight Concrete Columns for Seismic Design

Basile G. Rabbat, senior structural engineer; and Norman W. Hanson, principal structural engineer, Construction Technology Laboratories, Portland Cement Association, Skokie, Illinois

### Prevention of Progressive Collapse of Cast-in-Place Slabs by Means of Tensile Membrane Action

William D. Cook, research assistant; Denis Mitchell, associate professor; and Suresh Shrivastava, assistant professor, McGill University, Montreal, Quebec, Canada

### Testing Reinforced Concrete in Pure Shear

Frank Vecchio, graduate student; and Michael P. Collins, professor, Department of Civil Engineering, University of Toronto, Toronto, Ontario, Canada

### The Inelastic Behavior of Reinforced Concrete Members Reinforced with Steel Fibers

Robert John Craig, assistant professor; and Jack Decker, Lawrence Dombrowski, and Bob Laurencelle, students, Department of Civil and Environmental Engineering, New Jersey Institute of Technology, Newark, New Jersey

### A Reexamination of Postcracking Models Used in Nonlinear Finite Element Analysis of Reinforced Concrete

Rafael Jimenez-Perez, assistant professor, Department of Civil Engineering, University of Puerto Rico, Mayaguez, Puerto Rico

### Mortar Under Cyclic Compressive Loading

David Darwin, associate professor; and Atauliah Maher, graduate student, Department of Civil Engineering, University of Kansas, Lawrence, Kansas

### Lightweight Fiberglass Concrete

Shyam N. Shukla, research engineer, Lawrence Livermore Laboratory, Livermore, California; and J.M. Leaver, owner-general contractor, San Ramon, California

### Comparison of Fully Bedded and Face-Shell Bedded Concrete Block

Marvin E. Criswell, associate professor; and Charles J. Nacos, student, Civil Engineering Department, Colorado State University, Fort Collins, Colorado

### A P.D.Q. Method of Determination of Water-Cement Ratio of Concrete

Tarun R. Naik, associate professor; and Bruce W. Ramme, graduate student, Civil Engineering Department, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin



### Special Recognition for ACI Fellows & Members

A gold lapel pin especially created to recognize ACI Fellows. The pins are approximately of 1/2-in. size and feature the ACI emblem as well as Fellow indication. Price is \$7.95 each.

A lapel pin in blue enamel is also available for members at \$7.95 each.

Buy your lapel pin at the registration desk.

THURSDAY, SEPTEMBER 25

2:00 p.m.-5:00 p.m.

West Ballroom

## DESIGN OF TALL BUILDINGS TO RESIST WIND AND EARTHQUAKE

sponsored by ACI Committee 442

**Session Chairman:** S.M. Uzumeri, chairman, ACI Committee 442, and professor, Department of Civil Engineering, University of Toronto, Toronto, Ontario, Canada

### Preliminary Dimensioning of Tall Concrete Structures

**Mario Paparoni M.**, professor, Faculty of Engineering, Central University of Venezuela, Caracas, Venezuela

### Analysis of Intersecting Shear Walls

**Bernardo Deschappelles**, partner, Hernandez & Hernandez Consulting Engineers, San Juan, Puerto Rico

### Designing Tall Buildings for Wind Risk

Alan G. Davenport, professor and director, Boundary Layer Wind Tower Laboratory, University of Western Ontario, London, Ontario, Canada

### From Experiment to Practice in Earthquake Resistant Design

**Mete A. Sozen**, professor of civil engineering, University of Illinois, Urbana, Illinois

### Seismic Resistance of Frame-Wall Reinforced Concrete Buildings

Vitelmo V. Bertero, professor of civil engineering, and E. Aktan, research engineer, University of California, Berkeley, California

THURSDAY, SEPTEMBER 25

7:30 p.m.-10:00 p.m.

East Ballroom

## FORUM: HOW SAFE ARE THE SEISMIC PROVISIONS FOR CONCRETE STRUCTURES IN BUILDING CODES?

sponsored by ACI Committees 114 and 442

**Chairman:** Robert L. Henry, chairman, ACI Committee 114, and chief engineer, Texas Testing Laboratories, Dallas, Texas

**Moderator:** Ignacio Martin, member of ACI Committee 442, and partner of Capacete, Martin & Associates, San Juan, Puerto Rico

**Panelists:** Vitelmo V. Bertero, professor of civil engineering, University of California, Berkeley, California

**Mete A. Sozen**, professor of civil engineering, University of Illinois, Urbana, Illinois

**Cesar Hernandez**, partner of Hernandez y de la Rosa, Caracas, Venezuela

The objective of this forum is to examine the safety of concrete structures subject to seismic loads considering the present knowledge of the behavior of concrete structures under seismic loads, the corresponding provisions in building codes, and the design and construction practices.

**The State of the Art:** Research, investigation of performance of concrete structures subjected to earthquakes, levels of damage, repair and strengthening of existing structures.

**Seismic Provisions in Building Codes:** Historical background, present codes, seismic risk, methods of analysis, performance requirements, detailing provisions.

**Design and Construction Practices:** Framing systems, methods of analysis, detailing of concrete structures, construction practices, strength evaluation, repair of damaged concrete structures.

The forum will consist of short presentations and then the session will be opened for discussion with speakers remaining as a panel.

## STUDENT ACTIVITIES PROGRAM

sponsored by ACI Committee E-801

This program has three main goals:

1. Create student interest and familiarity with ACI;
2. Stimulate some interest in working on concrete projects as students at both the undergraduate and graduate levels;
3. Show students some of the existing careers in concrete construction and design.

The program is geared for the following: (1) Students—undergraduate and graduate; (2) young members of ACI; and (3) those interested in Committee E-801 activities.

**Session Chairman:** Robert John Craig, chairman, ACI Committee E-801, and assistant professor, Department of Civil and Environmental Engineering, New Jersey Institute of Technology, Newark, New Jersey

### PROGRAM

#### Discussion of the Technical Activities of ACI

Joseph A. Dobrowolski, member of TAC and EAC, consulting engineer, lecturer at California State at Long Beach, Altadena, California. He will explain what the TAC does, and will give a brief presentation on some technical concrete projects.

#### Codes and Specifications for Design and Construction

Gerald B. Neville, Secretary, ACI Committee 318 and manager, Structural Codes, Portland Cement Association, Skokie, Illinois. He will briefly describe the function of the ACI Committee 318 and go through the procedure of how the codes and specifications are set up.

#### Careers in Concrete Construction and Design

William E. Brewer, member of E-801, associate professor at Bowling Green State University, construction technology, and principal in consulting firm of Brewer and Associates, Bowling Green, Ohio. He will talk on design, construction, product development and research, testing, plant production and supervision, etc.

#### Concrete Canoe Racing Program

Michael McGlinchy, project manager, City of Akron; and Thomas Nixdorf, student, University of Akron, Akron, Ohio, both members of Committee E-801. They will explain how to construct and race canoes. Slides and film will be shown. A short discussion and feedback will get the students' views of this activity.

#### Concrete Projects in Civil Engineering Education

Robert John Craig, chairman of ACI Committee E-801, and assistant professor, Civil and Environmental Engineering, New Jersey Institute of Technology, Newark, New Jersey. He will present a couple of concrete projects on which students have worked as undergraduates, both technical and non-technical in nature. Also, a discussion and feedback on how the ACI Committee E-801 can develop interest in student projects will be included.

#### Social Hour

Walter M. Ruiz, professor and consulting engineer, University of Puerto Rico, Mayaguez, Puerto Rico, will set up a social event at the Convention so that ACI can discuss things on an individual basis with the students.



## ACI 1981 Conventions

#### Annual Convention

February 8-13  
with World of Concrete  
Hyatt Regency of Dallas  
Dallas, Texas

#### Fall Convention

September 20-25  
Quebec Hilton Hotel  
Quebec, Quebec, Canada

## DESIGN, CONSTRUCTION, AND REPAIR OF MARINE CONSTRUCTION

**Session Chairman:** Raymond J. Schutz, director, Product Development, Protex Industries, Denver, Colorado

### Concrete and Seawater

Bryant Mather, chief, Structural Laboratories, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi

### Design of Permanent Seawater Structures to Prevent Deterioration

Morris Schupack, president, Schupack, Suarez Engineers Inc., South Norwalk, Connecticut

### Repair of Seawater Structures—An Overview

I. Leon Glassgold, president, Masonry Resurfacing and Construction Company, Inc., Baltimore, Maryland

### Repair of Seawater Structures—A Case History

Joseph Heneghan, president, Gunitex Masonry Company, North Bellmore, New York

### The Repair of Concrete Piles by Use of Fiber Reinforced Jackets

Carl W. Scheffel, vice president and chief engineer, Fox Industries, Inc., Baltimore, Maryland



## DESIGN CONCEPTS FOR SPLICES AND DEVELOPMENT OF REINFORCEMENT

sponsored by ACI Committee 408

**Session Chairman:** Peter Gergely, professor, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York

### Suggested Development, Splice, and Standard Hook Provisions for Deformed Bars in Tension

James O. Jirsa, professor, Civil Engineering Structures Research Laboratory, University of Texas, Austin, Texas; and Leroy A. Lutz, vice president, Computerized Structural Design, Inc., Milwaukee, Wisconsin

### Development and Splice Provisions in the German Code and in the CED Model Code

R. Ellgehausen, research engineer, University of Stuttgart, Stuttgart, Germany

### The Design of Anchorages and Splices

Ralejs Tefers, associate professor, Chalmers University of Technology, Goteborg, Sweden

### The Top Bar Effect On Development of Bars and Splices

Denis Mitchell, associate professor; and M. Saeed Mirza, professor, Department of Civil Engineering, McGill University, Montreal, Quebec, Canada; and James O. Jirsa, professor, Civil Engineering Structures Research Laboratory, University of Texas, Austin, Texas

### The Design of Tension Splices for High-Level Repeated Loading

Fernando E. Fagundo, Jr., assistant professor, Department of Civil Engineering, University of Florida, Gainesville, Florida; Peter Gergely, professor, and Richard N. White, professor and director, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York.

## DYNAMIC MODELING OF CONCRETE STRUCTURES

sponsored by ACI Committee 444

**Session Chairman:** Harry G. Harris, associate professor, Department of Civil Engineering, Drexel University, Philadelphia, Pennsylvania

**Co-chairman:** Robert John Craig, assistant professor, Department of Civil and Environmental Engineering, New Jersey Institute of Technology, Newark, New Jersey

### Use of Dynamic Models in Concrete Research—An Historical Perspective

M.S. Mirza, professor, Department of Civil Engineering, McGill University, Montreal, Quebec, Canada; and H.G. Harris, associate professor, Department of Civil Engineering, Drexel University, Philadelphia, Pennsylvania

### Techniques for In-Plane Vibration and Shear Testing of Model Floor Slabs

Ti Huang and Le-Wu Lu, professors of civil engineering, Fritz Engineering Laboratory, Lehigh University, Bethlehem, Pennsylvania; and H. Faruk Karadogen, assistant professor of civil engineering, Istanbul Technical University, Istanbul, Turkey

### Impact Loading of a Reinforced Concrete Beam to Column Joint

A.J. Watson, lecturer, Civil and Structural Engineering Department, University of Sheffield, Sheffield, England; and J.E. Inkester, design engineer, United Kingdom Atomic Energy, Risley Nuclear Power Development Establishment, Warrington, Cheshire, England

### Behavior of Small-Scale Reinforced Concrete Model Structures

Daniel P. Abrams, assistant professor, Department of Civil Engineering, University of Colorado at Boulder, Boulder, Colorado

### Impact of a Steel Rod on a Reinforced Concrete Slab

Larsgunnar Nilsson, associate professor, Division of Structural Engineering, University of Lulea, Lulea, Sweden; and Sven Sahlin, professor, Royal Institute of Technology, Stockholm, Sweden

### Testing of Model Precast Shear Walls on a Shake Table

H.G. Harris and J.J. Wang, Department of Civil Engineering, Drexel University, Philadelphia, Pennsylvania

## Historical Facts

- 1493 Puerto Rico discovered by Columbus.
- 1508 Colonized by Spain under Ponce de Leon.
- 1595 Sir Francis Drake attacks island.
- 1625 Dutch burn San Juan.
- 1873 Slavery abolished.
- 1898 Spanish-American war. Puerto Rico becomes part of U.S.A.
- 1917 Puerto Ricans granted U.S. citizenship.
- 1934 Prohibition repealed.
- 1950 U.S. Congress votes Puerto Rico's right to decide their own Constitution.
- 1951 Puerto Ricans approve new Constitution guaranteeing secret ballot, freedom of press, worship and right to assemble, right to education and equal justice to all citizens.
- 1952 The Commonwealth of Puerto Rico officially established—a free state associated with the U.S.A. through a bilateral contract ratified by the people of Puerto Rico and the Congress of the United States.
- 1964 U.S. Congress establishes commission to study among other things the possibility of an island-wide referendum to let the people of Puerto Rico directly express their preference for either Commonwealth, Statehood, or Independence.



## Useful Spanish Phrases

Buenos días  
bweh-nohs dee-ahs  
Good morning

Buenas tardes  
bweh-nahs tahr-dehs  
Good afternoon

Buenas noches  
bweh-nahs noh-chehs  
Good evening

¿Qué pasa?  
keh pah-sah  
How's everything?

¿Cómo está usted?  
koh-moh ehs-tah oos-tehth  
How are you?

Muy bien, gracias  
moo-ee byehn grahs-yahs  
Very well, thanks

Señor  
sen-yor  
Mister

Señorita  
sen-yor-eet-ah  
Miss

Señora  
sen-yor-ah  
Mrs.

Mucho gusto en conocerle  
moo-choh goos-toh ehng koh-noh-sehr-leh  
Very glad to meet you

Adiós  
ahth-yohs  
Goodbye—or hello  
(When saying hello in passing, the Spanish say  
“adios”—“Goodbye”)

Hasta luego

ahs-tah loo-eh-goh

Until then

## Numbers and Money

uno, dos, tres, cuatro, cinco  
oo-noh, dohs, trehs, kwah-troh, seeng-koh  
one, two, three, four, five

seis, siete, ocho, nueve, diez  
says, syeh-teh, oh-choh, nweh-beh, dyehs  
six, seven, eight, nine, ten

Pesos, centavos  
peh-sohs, sehn-tah-vohs  
Dollars, cents

¿Cuánto?  
kwahn-toh  
How much?

Muy barato  
moo-ee bah-rah-toh  
Very cheap

Demasiado caro  
deh-mahs-yah-thoh kah-roh  
Too expensive

La cuenta, por favor  
lah kwehn-tah pohr fah-bohr  
Check, please

Estoy pelado!  
ehs-toy pehl-ah-doh  
I'm broke!

## Conversation

¿Cómo se llama?  
koh-moh seh yah-mah  
What is your name?

Me llamo...  
meh yah-moh  
My name is...

¿Dónde vive usted?  
dohn-deh bee-beh oos-tehth  
Where do you live?

Tú\* eres muy guapa  
too eh-rehs moo-ee gwah-pah  
You're very pretty

Usted es muy guapo  
oos-tehth es moo-ee gwah-poh  
You're very handsome

¿Nos vemos mañana?  
mohs beh-mohs mahn-yah-nah  
May I meet you tomorrow?

Con mucho gusto  
kohn moo-choh goos-toh  
With pleasure

Sí, no, quizás  
see, noh, kee-sahs  
Yes, no, maybe

Te quiero mucho  
teh kyeh-roh moo-choh  
I like you a lot

Vamos a bailar  
bah-mohs ah by-lahr  
Let's dance

\*In Spanish there are two ways to say “you”; “usted” is the formal phrase, and “tú” is the familiar for close friends or relatives.

## Typical Phrases

Ay bendito!  
ahee behn-dee-toh  
Oh my gosh!

Caramba  
kahr-ahm-bah  
Gee whiz

¿Qué suerte!  
keh swehr-teh  
What luck!

¿Qué bueno!  
keh bweh-noh  
That's great!

Olvidalo  
ohl-bee-dah-loh  
Forget it!

¿Qué pollo!  
keh pohl-yoh  
What a doll!

Salud, dinero y amor, y tiempo para gozarlos...!  
sah-lood dee-neh-roh ee ah-mohr e tyehm-poh  
pah-rah goh-sahr-lohs

Health, wealth and love, and time to enjoy them!

# Women's Program

## SUNDAY, SEPTEMBER 21

1:00 p.m.—5:00 p.m.

Registration

## MONDAY, SEPTEMBER 22

8:30 a.m.

Coffee and rolls

Registration

Afternoon

Slide presentation and talk on Puerto Rico. Conference on native crafts and artisans.

## TUESDAY, SEPTEMBER 23

Morning

City tour: Includes the University of Puerto Rico Main Campus, the Experimental Botanical Gardens, the El Morro Fortress, and ends in Old San Juan. You may remain to shop within the Old San Juan area or return to the hotel. Tour lasts 3½ hours.

## WEDNESDAY, SEPTEMBER 24

All day (6 hours)

Tour to El Yunque Rain Forest and the Hyatt Rio Mar Beach Complex, including a visit to a local artisan who specializes in clay pottery. The Rio Mar Beach Club offers excellent varied recreational facilities as well as luncheon.

Evening

Concrete Mixer: This traditional event will be basically an exciting Puerto Rican rum party. It will be held at the Dominican Convent in Old San Juan. The Convent dates from Spanish colonial days and houses a museum and continuous cultural exhibitions which will be open to us. At the end of the cocktail hour there will be a short floor show by the folkloric group Aryeto.

## THURSDAY, SEPTEMBER 25

8:30 a.m.

Champagne Breakfast Program: A brief welcome from ACI President Charles J. Pankow and Executive Director George F. Leyh. Then Hotel sous chef and Gold Medal winner Hans Bange will tell you some of his experiences as chef in Europe and America. To finish off the program, we have William Kilpatrick, professional tour guide and lecturer, who will talk on Puerto Rico, its flora and fauna, the life of the Puerto Rican people, and why homes are built like they are on the island.

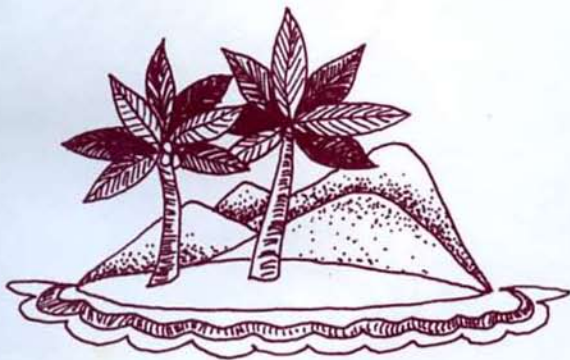
Afternoon

Visit to the Bacardi Rum Distillery and see how it's made.

## FRIDAY, SEPTEMBER 26

8:30 a.m.

Coffee and rolls. This is your last chance to get the names and addresses of your new friends so you can send them Season's Greetings and make plans to see them again in Dallas at the ACI convention, February 8-13, 1981.







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