Historical Overview of the *PCI Journal* and Its Contributions to the Precast/Prestressed Concrete Industry

Donald C. Raths, S.E., FPCI
Consulting Engineer
Raths, Raths & Johnson Inc.
Willowbrook, Ill.
and
Chair
Journal Advisory Committee (1992–2004)

George D. Nasser, FPCI
Editor Emeritus
Precast/Prestressed Concrete Institute
Chicago, Ill.
and
Editor-in-Chief
PCI Journal (1972–2004)

This article traces the beginnings of the PCI Journal *and recounts its central role in the technical advances of the precast/prestressed concrete industry over the past 50 years (1956–2006). The* PCI Journal *has evolved to become the primary technical and research archive of the industry. Technical information published in the* PCI Journal *has provided vital research, technical, and marketing support for PCI committees, PCI members, and the design and construction community at large. Also, and importantly, papers and committee reports published in the* PCI Journal *have influenced the development of new practices and technologies related to design and construction of precast/prestressed concrete structures and, in many cases, have formed the impetus for the modification of national code provisions and specifications related to the design of precast/prestressed concrete. This article expands on the contributions published in the* PCI Journal *and discusses the considerable effect they have had in sustaining the stature and growth of the industry.*

Fifty years ago, in May of 1956, the inaugural issue of the *PCI Journal* made its debut at the second convention of the Prestressed Concrete Institute (PCI) in Hollywood, Fla. (**Fig. 1**).[1] (PCI officially modified its name to Precast/Prestressed Concrete Institute in January 1989.) This special event was announced in the June 2, 1956, edition of the *Ft. Lauderdale Daily News* and was also picked up by other wire services across North America (see *PCI Journal* is Announced).

The *PCI Journal* appeared less than two years after the formation of PCI on June 18, 1954, in Tampa, Fla., and six years after the construction of the Walnut Lane Memorial Bridge in Philadelphia, Pa., in 1950—the first major prestressed concrete bridge in the United States. The construction of the 160-ft-long (49 m) Walnut Lane Memorial Bridge is generally recognized as the single most important event sparking the beginning of the precast/prestressed concrete industry in North America.

On the world scene, the 1950s were politically charged times. After three years, the Korean War finally ended in 1953. In 1956, the year that the *PCI Journal* was born, Dwight D. Eisenhower was re-elected president of the United States. The Cold War between the former Soviet Union and the West was in full swing, there was considerable turmoil in the Middle East (especially during the Suez Canal crisis), and the Civil Rights Movement in the United States was just getting started.

Similar to Europe after World War II, there was a shortage of structural steel in the United States, which made concrete, and particularly prestressed concrete, an attractive alternative material. At first, new prestressing technology was only applied to bridge applications, but enterprising engineers and contractors quickly realized that the same technology could also be applied to buildings and other structures.

Two important developments in the early 1950s influenced the direction that the new technology would take: the development of seven-wire prestressing strand and long-line stressing beds for the production of standardized precast/prestressed concrete members. By employing new precasting techniques, prestressing operations could be made more efficient and economical. Thus, large-scale prefabrication using prestressing techniques provided the impetus for the establishment of precasting plants across the United States.

The possibilities for prefabrication were amply demonstrated with the construction of the 24-mile-long (39 km) Lake Pontchartrain Causeway from 1955 to 1956 near New Orleans, La., which at the time was the longest precast, prestressed concrete bridge crossing in the world. Another influential development in

Fig. 1. The first issue of the *PCI Journal* came out in May 1956.

PCI Journal is Announced

The following news item appeared in the *Ft. Lauderdale Daily News* on June 2, 1956, announcing the creation of the *PCI Journal*.

Prestress Institute Publishes New Journal

A new quarterly technical publication, the PCI Journal, made its debut at the recent second convention of the Prestressed Concrete Institute held at the Hollywood Beach Hotel in Hollywood, Florida, May 16–18, 1956.

A major objective of the Institute since it was organized in 1954, the magazine is under the editorial direction of Dr. A. M. Ozell, associate professor of civil engineering, University of Florida.

The first issue, which was distributed at the convention, contained articles by T. Y. Lin, W. E. Dean, J. C. Rundlett, Paul Zia, R. O. Kasten. A. M. Ozell and J. W. Cochrane, A. R. Anderson, L. E. Hill, Ross H. Bryan, and Lewis E. Weeks.

the promulgation of the precast concrete industry was the inauguration of the federally aided Interstate Highway Program in 1956. This highway system, together with the network of roads built around it, soon proved vital to the safe and economical transportation of precast concrete products to project sites.

Prestressed concrete was rapidly advancing, but during the early 1950s there was an absence of code provisions and specifications for the design and construction of prestressed concrete structures in the United States. At that time, technical information about prestressed concrete originated mostly in Europe. This lack of national code provisions held back the growth of prestressed concrete throughout the United States during its early years.[2]

The founding fathers of PCI had the vision to realize that their fledgling organization needed a technical journal to document and disseminate the rapidly developing knowledge base on prestressed concrete in the United States. The decision to create a journal for the Institute was supported not only by leading engineers and academia affiliated with PCI but also by its founding producer members. Prominent among those advocating this decision were Arthur R. Anderson, Ross H. Bryan, William E. Dean, Harry H. Edwards, George Ford, Ben C. Gerwick Jr., J. Ashton Gray, T. Y. Lin, Pete Verna, and Charles C. Zollman.

The new *PCI Journal* was originally produced by the Civil Engineering Department of the University of Florida at Gainesville. The first editor of the *PCI Journal* was Professor Alan M. Ozell. He had the able support of professors Ralph W. Kluge and Donald A. Sawyer and especially the assistance of a young instructor named Paul Zia (a PCI Fellow, a long-time PCI Professional Member, and a former ACI president). Ozell, Kluge, Sawyer, and Zia were all faculty members at the university.

In the 1950s, much of the activity and technical innovations on the subject of precast/prestressed concrete were occurring in Florida. At the time, there were more precasting plants in Florida than in any other state. It was also in Florida where new products, such as double tees for buildings and standard I-beams for bridges, were being developed. The chief advocate for using prestressed concrete products in buildings was Edwards, founder of LEAP Associates and PCI's first secretary-treasurer. The movement toward using prestressed concrete members in bridges was led by Dean, chief bridge engineer of Florida's Highway Department. In addition, the University of Florida at Gainesville was performing considerable research and development work on precast/prestressed concrete. Therefore, it is understandable that PCI found its first headquarters in Florida.

PCI initially was located in Lakeland, Fla., in 1954, principally because it was the hometown of Edwards. Shortly afterward, PCI moved its executive offices to Fort Lauderdale, Fla., and then to nearby Boca Raton, Fla. PCI's first executive secretary was Col. Martin P. Korn, a retired army officer with a reputation as an expert in rigid frame steel structures. However, Korn quickly became enamored with the potential of prestressed concrete for buildings and bridges.

EVOLUTION OF THE *PCI JOURNAL*

In the beginning, the *PCI Journal* was published quarterly. From the start, the *PCI Journal* was envisioned as a hybrid publication, primarily publishing technical material in the form of authored papers and committee reports and also including current industry news, new technical developments, and advertising.

This early concept of the *PCI Journal* served the industry well, and the basic format continues successfully to this day. Early articles were mostly technical papers presented at PCI conventions and also included question-and-answer panel discussions. This section became a popular feature because experts provided authoritative answers to urgent problems facing the young industry. Subsequently, papers were submitted by independent authors and were only published after a thorough peer review.

In 1959, the PCI Executive Committee made the critical decision to relocate PCI headquarters from Boca Raton to Chicago, Ill. In effect, this changed PCI from a regional association to a national organization. Another advantage of the move was that several concrete-related organizations, especially the Portland Cement Association (PCA), were headquartered in the Chicago area.

The relocation was completed in December 1959 by the newly appointed executive secretary, Norman L. Scott, a PCI Medal of Honor recipient, PCI Fellow, and Titan.

In 1961, Scott hired Tom D'Arcy to be PCI's publications director. At about this time, the Executive Committee decided to convert the *PCI Journal* from a quarterly publication to a bimonthly publication, starting with the February 1962 issue. Among D'Arcy's responsibilities as publications director were producing the first six issues and serving as editor. D'Arcy continued in this position until he left PCI in September 1964. During his distinguished career, he received the PCI Medal of Honor, was named a PCI Titan and PCI Fellow, and served as both the Technical Activities Committee chair and PCI chairman (2005). For the brief period from September 1964 to September 1966, Russell J. Hammersmith, PCI's technical director, was editor of the *PCI Journal*.

In October 1966, PCI's new technical director, Daniel P. Jenny, assumed the duties of editor of the *PCI Journal*. Jenny continued as editor until July 1972. He was later honored as a PCI Fellow and Titan, and the annual PCI research fellowships were named the Daniel P. Jenny Research Fellowships in his honor.

With the explosive growth of the precast/prestressed concrete industry in the 1960s, the demands of the technical director became too great to allow adequate time to edit and produce a bimonthly journal, and a full-time editor was brought on staff. In August 1972, then–PCI executive director W. Burr Bennett Jr., with the assistance of Jenny, hired George D. Nasser. At the time, Nasser was associate editor of the *ACI Journal* for the American Concrete Institute (ACI) in Detroit, Mich. Bennett's instructions to the new editor were to "make the *PCI Journal* into the best technical journal in the world."

Nasser served in the position of editor-in-chief of the *PCI Journal* for the next 32 years until his retirement in 2004.

Under his stewardship, the *PCI Journal* evolved into the highly respected technical publication that it is today. A key development during his tenure was his decision in 1989 to change from the small 6 in. × 9 in. format to the more-versatile $8^1/_2$ in. × 11 in. magazine format. Since his retirement in 2004, Nasser has served as editor emeritus, assisting the editorial staff during the transition to a new editor. Nasser has been bestowed with the honors of PCI Fellow and Titan and is the namesake of the *PCI Journal* paper award for authors under the age of 40.

Frank Kurtz served as editor-in-chief from 2003 to August 2005, when Emily Lorenz was hired. Formerly an editor with ACI's *Concrete International* magazine, she has already implemented several notable editorial and aesthetic changes to the *PCI Journal* in an effort to enhance readability and update its format.

To guide the *PCI Journal* in its objectives, PCI's Technical Activities Committee established the Journal Advisory Committee in 1992. Its mission is to serve as an advisory group for the *PCI Journal* and guide its editorial staff regarding technical issues, advertising and circulation promotion, and other pertinent matters. Donald C. Raths served as chair of this committee for 13 years (from inception in 1992 through 2004). The current chair is Millard Barney of Concrete Technology Corp., a PCI Producer Member in Tacoma, Wash.

During its tenure, the Journal Advisory Committee has been instrumental in conducting readership surveys, submitting the *PCI Journal* to a peer-review evaluation by Cahners Publishing Co., and increasing circulation through the creation of the Gift Subscription Program, which allows PCI Producer Members to send the *PCI Journal* to potential clients at a reduced price. The committee also advises the editorial staff on technical content and format.

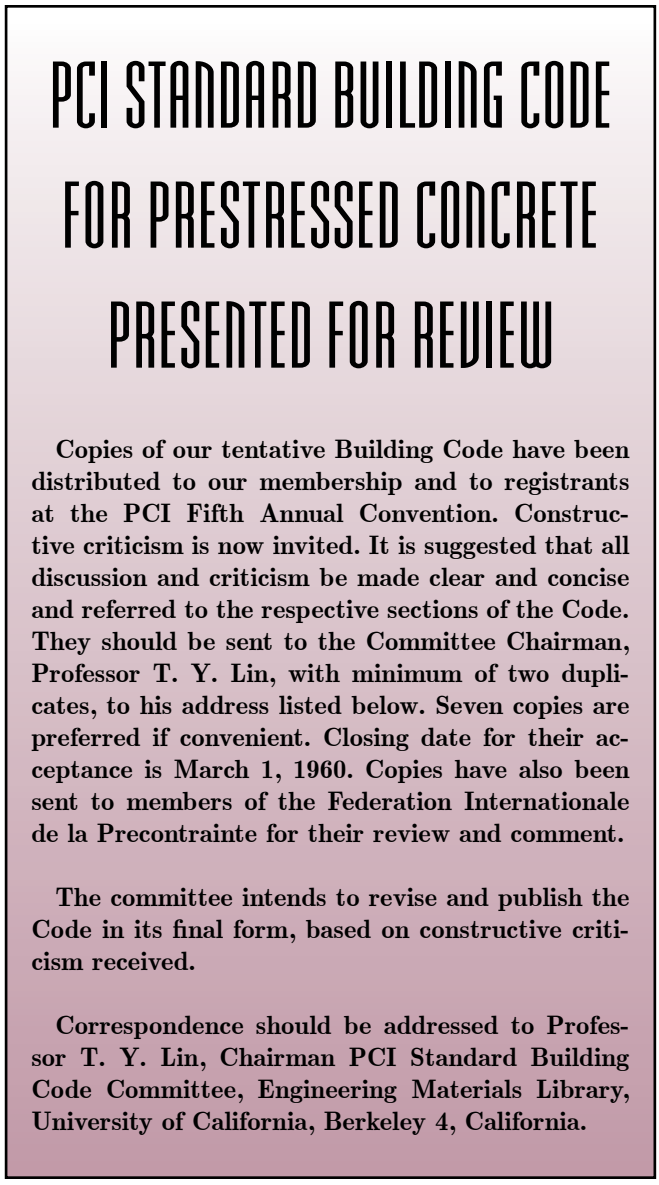
CODE DEVELOPMENTS

From the beginning, the editors of the *PCI Journal* were aware that the publication needed to lead the industry as a forum for the development of code provisions for precast/prestressed concrete.[2]

Because of the lack of published design standards, code provisions, recommended practices, and design manuals on during the early years of prestressed concrete's use in the United States, the *PCI Journal* filled the role of providing technical information on the design of prestressed concrete. There was a vital need to document and expand the technical knowledge base of this new type of construction material.

Early technical papers published in the *PCI Journal* contributed considerably to advancing the new industry and covered a wide range of subjects, including product types, design methods, research, fire testing, and novel construction techniques. Many of the early technical papers were written by industry pioneers, such as Lin, Dean, Anderson, Bryan, Gus Gustaferro, Gerwick, Alan Mattock, Kent Preston, Verna, Zia, Zollman, and several other notable authors.

With the principal initiative coming from Lin (chair of the PCI Building Code Committee), the Institute produced the first *PCI Standard Building Code for Prestressed Concrete*.



PCI STANDARD BUILDING CODE FOR PRESTRESSED CONCRETE PRESENTED FOR REVIEW

Copies of our tentative Building Code have been distributed to our membership and to registrants at the PCI Fifth Annual Convention. Constructive criticism is now invited. It is suggested that all discussion and criticism be made clear and concise and referred to the respective sections of the Code. They should be sent to the Committee Chairman, Professor T. Y. Lin, with minimum of two duplicates, to his address listed below. Seven copies are preferred if convenient. Closing date for their acceptance is March 1, 1960. Copies have also been sent to members of the Federation Internationale de la Precontrainte for their review and comment.

The committee intends to revise and publish the Code in its final form, based on constructive criticism received.

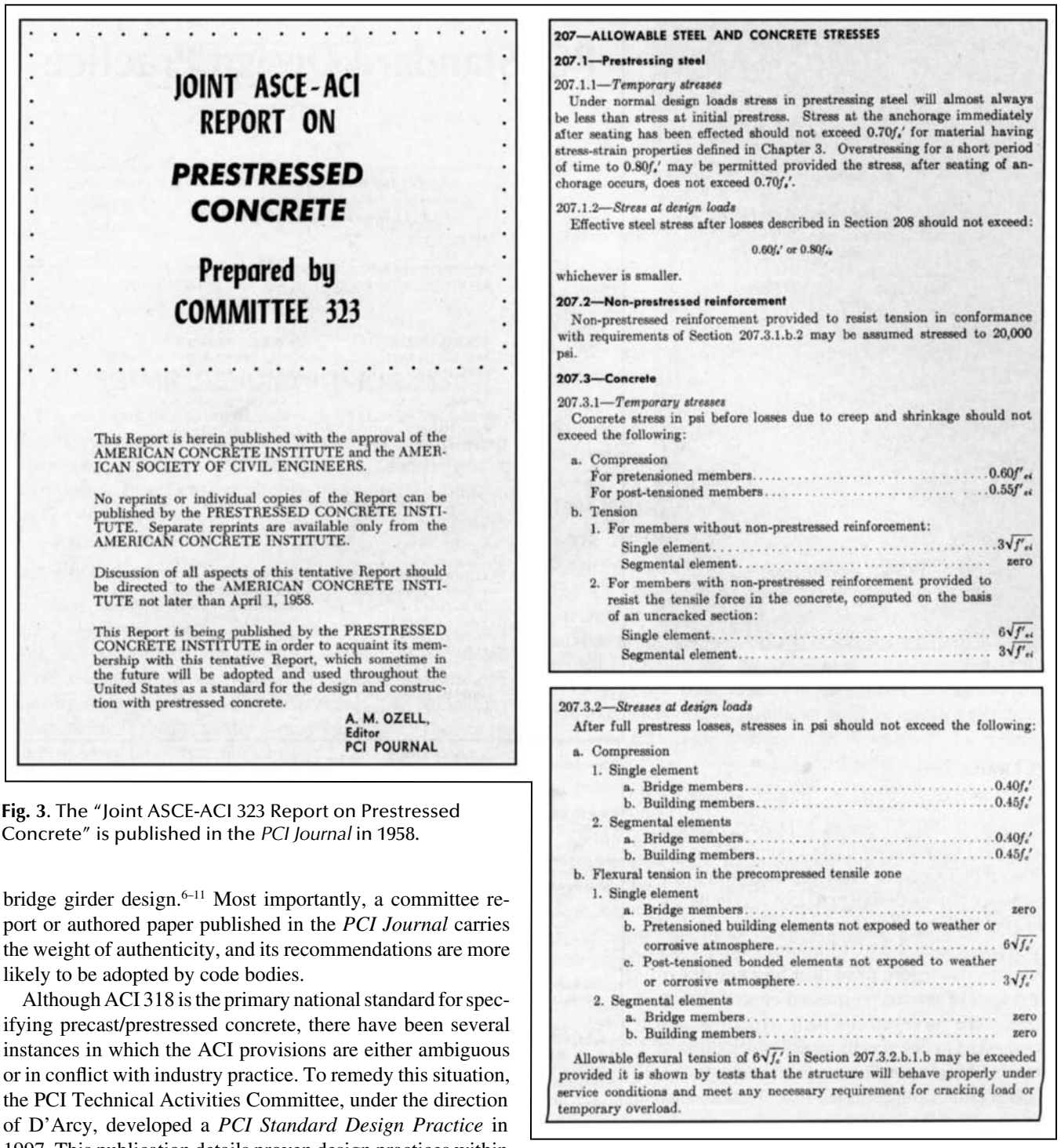
Correspondence should be addressed to Professor T. Y. Lin, Chairman PCI Standard Building Code Committee, Engineering Materials Library, University of California, Berkeley 4, California.

Fig. 2. Publication of the *PCI Standard Building Code for Prestressed Concrete* is announced in 1959 in the *PCI Journal*.

This important publication was announced in the December 1959 issue of the *PCI Journal* (**Fig. 2**).[3] Subsequently, an agreement was reached between ACI and PCI in which PCI agreed to refrain from publishing a separate building code on the condition that ACI would include a chapter on prestressed concrete in its standard building code.

While these negotiations were going on, a major development was the publication of the "Joint ASCE-ACI Report on Prestressed Concrete." This important report was concurrently published in the *ACI Journal* and the *PCI Journal* (**Fig. 3**).[4] This document, which had input from PCI, was the basis for the first code provisions on prestressed concrete in the 1963 edition of *Building Code Requirements for Reinforced Concrete (ACI 318-63)*.[5]

Over the years, papers published in the *PCI Journal* have had a great impact on building codes, specifications, design methodologies, and industry practice. These include topics such as corbel design, shear and torsion, shear friction, and



JOINT ASCE-ACI
REPORT ON
PRESTRESSED
CONCRETE
Prepared by
COMMITTEE 323

This Report is herein published with the approval of the AMERICAN CONCRETE INSTITUTE and the AMERICAN SOCIETY OF CIVIL ENGINEERS.

No reprints or individual copies of the Report can be published by the PRESTRESSED CONCRETE INSTITUTE. Separate reprints are available only from the AMERICAN CONCRETE INSTITUTE.

Discussion of all aspects of this tentative Report should be directed to the AMERICAN CONCRETE INSTITUTE not later than April 1, 1958.

This Report is being published by the PRESTRESSED CONCRETE INSTITUTE in order to acquaint its membership with this tentative Report, which sometime in the future will be adopted and used throughout the United States as a standard for the design and construction with prestressed concrete.

A. M. OZELL,
Editor
PCI POURNAL

207—ALLOWABLE STEEL AND CONCRETE STRESSES

207.1—Prestressing steel

207.1.1—*Temporary stresses*
Under normal design loads stress in prestressing steel will almost always be less than stress at initial prestress. Stress at the anchorage immediately after seating has been effected should not exceed $0.70f_s'$ for material having stress-strain properties defined in Chapter 3. Overstressing for a short period of time to $0.80f_s'$ may be permitted provided the stress, after seating of anchorage occurs, does not exceed $0.70f_s'$.

207.1.2—*Stress at design loads*
Effective steel stress after losses described in Section 208 should not exceed:

$0.60f_s'$ or $0.80f_y$

whichever is smaller.

207.2—Non-prestressed reinforcement
Non-prestressed reinforcement provided to resist tension in conformance with requirements of Section 207.3.1.b.2 may be assumed stressed to 20,000 psi.

207.3—Concrete

207.3.1—*Temporary stresses*
Concrete stress in psi before losses due to creep and shrinkage should not exceed the following:

a. Compression
For pretensioned members ..... $0.60f'_{ci}$
For post-tensioned members ..... $0.55f'_{ci}$
b. Tension
1. For members without non-prestressed reinforcement:
Single element ..... $3\sqrt{f'_{ci}}$
Segmental element ..... zero
2. For members with non-prestressed reinforcement provided to resist the tensile force in the concrete, computed on the basis of an uncracked section:
Single element ..... $6\sqrt{f'_{ci}}$
Segmental element ..... $3\sqrt{f'_{ci}}$

207.3.2—*Stresses at design loads*
After full prestress losses, stresses in psi should not exceed the following:

a. Compression
1. Single element
a. Bridge members ..... $0.40f_c'$
b. Building members ..... $0.45f_c'$
2. Segmental elements
a. Bridge members ..... $0.40f_c'$
b. Building members ..... $0.45f_c'$
b. Flexural tension in the precompressed tensile zone
1. Single element
a. Bridge members ..... zero
b. Pretensioned building elements not exposed to weather or corrosive atmosphere ..... $6\sqrt{f_c'}$
c. Post-tensioned bonded elements not exposed to weather or corrosive atmosphere ..... $3\sqrt{f_c'}$
2. Segmental elements
a. Bridge members ..... zero
b. Building members ..... zero

Allowable flexural tension of $6\sqrt{f_c'}$ in Section 207.3.2.b.1.b may be exceeded provided it is shown by tests that the structure will behave properly under service conditions and meet any necessary requirement for cracking load or temporary overload.

Fig. 3. The "Joint ASCE-ACI 323 Report on Prestressed Concrete" is published in the *PCI Journal* in 1958.

bridge girder design.[6–11] Most importantly, a committee report or authored paper published in the *PCI Journal* carries the weight of authenticity, and its recommendations are more likely to be adopted by code bodies.

Although ACI 318 is the primary national standard for specifying precast/prestressed concrete, there have been several instances in which the ACI provisions are either ambiguous or in conflict with industry practice. To remedy this situation, the PCI Technical Activities Committee, under the direction of D'Arcy, developed a *PCI Standard Design Practice* in 1997. This publication details proven design practices within the precast/prestressed concrete industry (**Fig. 4**). This report was first published in the *PCI Journal* and then incorporated into the fifth (1999) and sixth (2004) editions of the *PCI Design Handbook: Precast and Prestressed Concrete*.[12,13]

The technical quality of the *PCI Journal* has been validated over the years by its papers winning the prestigious T. Y. Lin Award 26 times over the past 34 years. This award, which is sponsored by the American Society of Civil Engineers (ASCE), is presented to authors for the best technical paper on prestressed concrete submitted by ACI, ASCE, or PCI. Typically, the PCI-nominated paper is selected from one of the *PCI Journal*–award winning papers.

The technical archives of the *PCI Journal* over the past 50 years comprise over 2000 papers that have been peer reviewed by recognized industry experts and professional members of PCI. In general, at least six reviewers from a pool of more than 100 are assigned to technically critique a submitted manuscript. This important technical peer review adds considerable value to the manuscript submitted for publication.

The range of papers published in the *PCI Journal* covers academic and industry research and development, practical design of precast/prestressed concrete structural systems, design recommendations, building code updates, project stories illustrating creative design and construction methods for buildings and bridges, committee reports, and timely reports

on structural damage caused by earthquakes, hurricanes, tornados, fires, and other natural disasters.

Over the years, the editors of the *PCI Journal* have been cognizant of the importance of making the journal's technical information available to the design community. Key papers have been made available on the PCI website. Also, reference cards containing the title, author(s), abstract, keywords, and so forth, for all published reports and articles from 1956 to the present are on the PCI website under "Publications" and "*PCI Journal*" (www.pci.org/publications/journal).

During the past 30 years, two author-and-subject indexes of the *PCI Journal* have been published: a 25-year index (1956–1981) and a 10-year supplement (1982–1991) (**Fig. 5**). Currently, a 50-year cumulative author-and-subject index is being prepared.

The role of the *PCI Journal* has evolved and expanded over the years to serve the needs of PCI members. As the technical and research archives of the Institute, it is a source of documentation and validation of the technical knowledge of the industry's precast/prestressed concrete products. The *PCI Journal* also serves as the messenger to the PCI membership and the academic, design, and construction communities.

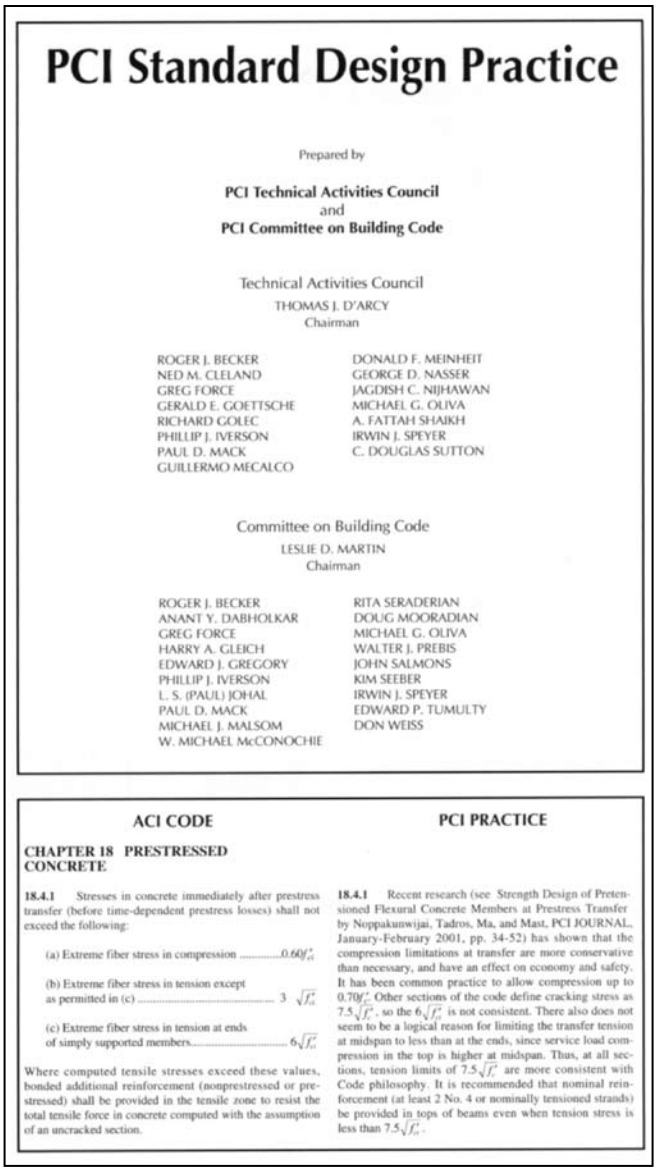
While the *PCI Journal* initially was the sole outlet for dissemination of technical information on precast/prestressed concrete, today it complements the many technical design manuals published by PCI. For example, it provides background information and practical applications of the design information contained in the *PCI Design Handbook*, *Architectural Precast Concrete*, *Precast Prestressed Concrete Bridge Design Manual*, and other PCI publications.

In order to better serve the PCI membership, the Journal Advisory Committee conducted an in-depth survey of Professional Members and Producer Members in 1993 and then followed up the survey with a second survey of producer chief engineers in 1998. The results of these surveys reinforced the need to disseminate to designers more industry-related technical information.

In addition, the survey also highlighted that designers would like to receive more practical information on design and construction applications of precast/prestressed concrete products and practical solutions to real-world problems. A 1995 survey of *PCI Journal* readers by Cahners indicated that the technical material it contained was the most desired type of information among *PCI Journal* readers.

To help attract the quality papers published in the *PCI Journal*, four awards have been established to honor those authors who have submitted exceptional papers to PCI. Recognizing these award winners has become a key part of PCI's annual conventions. These annual awards are the following:

- Martin P. Korn Award, established in 1960 in honor of PCI's first executive secretary, for the best design/research paper appearing in the *PCI Journal* during a single year;
- Robert J. Lyman Award, established in 1976 in honor of PCI's executive director from 1963 to 1968, for the best construction/production/erection paper appearing in the *PCI Journal* during a single year;



PCI Standard Design Practice

Prepared by

PCI Technical Activities Council
and
PCI Committee on Building Code

Technical Activities Council
THOMAS J. D'ARCY
Chairman

ROGER J. BECKER
NED M. CLELAND
GREG FORCE
GERALD E. GOETTSCHE
RICHARD GOLEC
PHILLIP J. IVERSON
PAUL D. MACK
GUILLERMO MECALCO
DONALD F. MEINHEIT
GEORGE D. NASSER
JAGDISH C. NIJHAWAN
MICHAEL G. OLIVA
A. FATTAH SHAIKH
IRWIN J. SPEYER
C. DOUGLAS SUTTON

Committee on Building Code
LESLIE D. MARTIN
Chairman

ROGER J. BECKER
ANANT Y. DABHOLKAR
GREG FORCE
HARRY A. GLEICH
EDWARD J. GREGORY
PHILLIP J. IVERSON
L. S. (PAUL) JOHAL
PAUL D. MACK
MICHAEL J. MALSOM
W. MICHAEL McCONOCHIE
RITA SERADERIAN
DOUG MOORADIAN
MICHAEL G. OLIVA
WALTER J. PREBIS
JOHN SALMONS
KIM SEEBER
IRWIN J. SPEYER
EDWARD P. TUMULTY
DON WEISS

ACI CODE

CHAPTER 18 PRESTRESSED CONCRETE

18.4.1 Stresses in concrete immediately after prestress transfer (before time-dependent prestress losses) shall not exceed the following:

(a) Extreme fiber stress in compression ..... $0.60f'_{ci}$

(b) Extreme fiber stress in tension except as permitted in (c) ..... $3\sqrt{f'_{ci}}$

(c) Extreme fiber stress in tension at ends of simply supported members ..... $6\sqrt{f'_{ci}}$

Where computed tensile stresses exceed these values, bonded additional reinforcement (nonprestressed or prestressed) shall be provided in the tensile zone to resist the total tensile force in concrete computed with the assumption of an uncracked section.

PCI PRACTICE

18.4.1 Recent research (see Strength Design of Pretensioned Flexural Concrete Members at Prestress Transfer by Noppakunwijai, Tadros, Ma, and Mast, PCI JOURNAL, January-February 2001, pp. 34-52) has shown that the compression limitations at transfer are more conservative than necessary, and have an effect on economy and safety. It has been common practice to allow compression up to $0.70f'_{ci}$. Other sections of the code define cracking stress as $7.5\sqrt{f'_c}$, so the $6\sqrt{f'_{ci}}$ is not consistent. There also does not seem to be a logical reason for limiting the transfer tension at midspan to less than at the ends, since service load compression in the top is higher at midspan. Thus, at all sections, tension limits of $7.5\sqrt{f'_c}$ are more consistent with Code philosophy. It is recommended that nominal reinforcement (at least 2 No. 4 or nominally tensioned strands) be provided in tops of beams even when tension stress is less than $7.5\sqrt{f'_{ci}}$.

Fig. 4. *PCI Standard Design Practice* is published in the *PCI Journal* in 1997.

- Charles C. Zollman Award, established in 1981 in honor of Zollman's major role in the design-construction of the Walnut Lane Memorial Bridge and his leadership role as PCI's first chair of the Technical Activities Committee, for the best state-of-the-art paper on precast and prestressed concrete appearing in the *PCI Journal* during a single year; and
- George D. Nasser Award, established in 2004 in honor of Nasser's leadership as editor-in-chief of the *PCI Journal* for more than 30 years, recognizing authors 40 years of age or younger who write outstanding *PCI Journal* papers on design, research, production, or construction.

The quality and success of the *PCI Journal* over the past 50 years has been largely due to the dedication of PCI members, editors, technical support staff, and reviewers of manuscripts, who so generously contribute their time and talent.

In many cases, papers published in the *PCI Journal* have been responsible for revisions to codes and standards. For

Fig. 6. The *PCI Journal* published author-and-subject indexes for its 10-year and 25-year anniversaries. A 50th anniversary index is in the works.

example, the Washington State Department of Transportation (DOT) *Bridge Design Manual* and the American Association of State Highway and Transportation Officials' *AASHTO LRFD Bridge Design Specifications* were revised based on a Martin P. Korn Award–winning paper published in 2005.[11] Other state DOTs have insisted on publishing technical papers in the *PCI Journal* prior to adopting new technical standards.

Committee reports are another important source of technical material published in the *PCI Journal*. These reports, which carry the Institute's authority, have played a profound role in influencing design, production, and construction practices. To honor PCI committees for producing excellent technical committee reports, a Certificate of Merit Award, renamed the Leslie D. Martin Award of Merit in 2005, was established in 1983. The notable committee reports published in the *PCI Journal* during the past 50 years are listed in the "Landmark Papers" section at the end of this article.

INFLUENCE OF RESEARCH AND DEVELOPMENT

A major source of technological innovation in precast/prestressed concrete has come from the PCI-funded research and development programs, including the high-priority research topics as well as the Daniel P. Jenny research fellowships. Direction and funding for these programs originates mainly at PCI, but in most instances there is also substantial financial assistance from government agencies such as the National Science Foundation (NSF), universities, PCI Producer Members, suppliers to the industry, and other organizations. The *PCI Journal* usually publishes the results of these research programs in the form of authored papers or summary reports.

The most important initiative in recent years was the multimillion-dollar PRESSS (precast seismic structural systems) research program, which was primarily funded by NSF with substantial support from the precast/prestressed concrete industry. The 10-year research program culminated with the testing of a nearly full-scale five-story building at the University of California, San Diego.[14,15] Both a pretensioned and post-tensioned precast, prestressed concrete hybrid frame and a post-tensioned wall panel system were successfully tested. So far, the most important structure constructed using a hybrid post-tensioned precast concrete frame system is the Paramount, a 39-story building in downtown San Francisco, Calif.[16] However, several other structures have also been constructed using this hybrid-frame concept. In the years to come, as PRESSS gets broader code approval, it is expected that the benefits of this new technology will become more widespread.

Another important research project was the recently completed program on development of design criteria for headed studs conducted by Wiss, Janney, Elstner Associates Inc. The research included both shear and combined shear and tension testing programs.[17,18] The results of this research have been incorporated into the sixth edition of the *PCI Design Handbook*, and code provisions for ACI 318 are being proposed. See page 82 in this issue of the *PCI Journal*.

Currently, a major PCI research program on development of a design methodology for precast concrete diaphragms is being carried out by a consortium of three universities: the University of Arizona, Lehigh University, and the University of California, San Diego.[19,20] The research is funded primarily by NSF, with additional support from PCI, the Charles Pankow Foundation, and associated universities. It is expected that the results of this research will be instrumental in designing precast/prestressed concrete structures in high seismic regions.

In addition to the major research programs outlined previously, PCI has several ongoing research projects at many

universities and research centers across the United States and Canada. Much of this work has resulted in code changes favorable to the precast/prestressed concrete industry.

In addition to research carried out in North America on precast/prestressed concrete, a large amount of complementary work has been conducted in other countries. Over the years, PCI has been fortunate to have the results of this important work published in the *PCI Journal*.[21–31] Some of this work is also recognized in "Landmark Papers" and "Special Thematic Issues" at the end of this article. PCI is grateful to the authors of these papers for their valuable contributions that have advanced the industry.

LOOKING TO THE FUTURE

From the foregoing chronology and history, it is clear that the *PCI Journal* has played a vital role in advancing the precast/prestressed concrete industry over the past 50 years. Today, the *PCI Journal* stands tall as the recognized authority on precast/prestressed concrete, and it continues to serve its membership's technical needs. Its future is bright because it represents a dynamic industry that is based on technical innovation and a multitude of versatile building products.

How can the *PCI Journal* contribute to advancing the precast/prestressed concrete industry in the future? Part of the answer to this question can be found in former chairman Mike Quinlan's Chairman's Message in the September–October 2003 *PCI Journal*,[32] "The Challenge of Delivering Technology to the Design Community," in which he recognizes PCI's success in developing and maintaining information and technology but points to our shortcomings in delivering this knowledge to the thousands of prospective architects and engineers in the design community. The *PCI Journal* can play a central role by reaching out beyond the PCI membership and existing subscribers by expanding its circulation. Other initiatives could create more interaction with those in the design and construction community via the Internet by enhancing *PCI Journal* features and providing more technical information on the PCI website. This includes putting all *PCI Journal* articles (1956–present) on the PCI website.

A survey of Gift Subscription Program sponsors and recipients conducted in the fall of 2004 illustrated the value of this program to both recipients and sponsors. The program plays an important role in building relationships between producers and designers and influencing design professionals in their decisions about industry products and building systems. With these initiatives, PCI can leverage its technology and put more of its technical knowledge in the hands of designers and decision makers.

The current editor-in-chief, Emily Lorenz, has implemented changes to the cover and aesthetics with a view to improving the appearance of the *PCI Journal*. The integrity and technical quality of the *PCI Journal* will continue under her editorial leadership. (Read more about Lorenz's vision for 2007 in her Editor's Message on page 15). As we move ahead into the 21st century, the *PCI Journal* will continue its role in serving the PCI membership, maintaining the technical archives of the Institute, and disseminating technical information on cutting-edge design, research and development, and use of precast/prestressed concrete products. In these ways, the *PCI Journal* will contribute to the advancement of the industry over the next 50 years.

As former president Robert A. Matthews stated in his December 1962 President's Message,[33] "The challenges facing the prestressed concrete industry today are manifold. PCI with its past record of accomplishments and its membership devoted to unselfish service is well equipped to meet these challenges." This message still rings true today, even though the nature and complexity of our challenges have grown and changed.

If PCI is to meet the challenge of delivering an ever-evolving technology base to the designers and specifiers of precast/prestressed products and building systems, all available resources must be devoted to that objective. Together with PCI's other technical publications, the *PCI Journal* is a critical component in accomplishing this goal.

ACKNOWLEDGMENT

The authors express their deep appreciation to Steve Seguirant, Doug Sutton, Maher Tadros, and Paul Zia for reviewing the initial manuscript and for their very helpful comments in strengthening the value of the paper.

REFERENCES

1. Edwards, Harry. 1978. Reflections on the Beginnings of Prestressed Concrete in Florida—Part 3: The Innovators of Prestressed Concrete in Florida. *PCI Journal*, V. 23, No. 6 (November–December): p. 31.

2. D'Arcy, Thomas J., George D. Nasser, and S. K. Ghosh. 2003. Building Code Provisions for Precast/Prestressed Concrete: A Brief History. *PCI Journal*, V. 48, No. 6 (November–December): pp. 116–124.

3. Prestressed Concrete Institute. 1959. PCI Standard Building Code for Prestressed Concrete Presented for Review. *PCI Journal*, V. 4, No. 3 (December): p. 147.

4. ASCE-ACI Committee 323. 1958. Joint ASCE-ACI Report on Prestressed Concrete. *PCI Journal*, V. 2, No. 4 (March): pp. 28–62.

5. ACI Committee 318. 1963. *Building Code Requirements for Reinforced Concrete (ACI 318-63)*. Detroit, MI: American Concrete Institute (ACI).

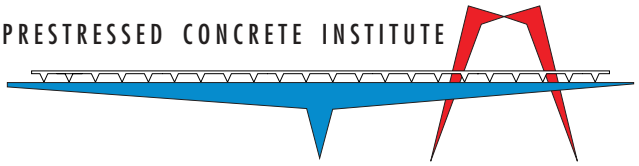
6. Mattock, Alan H. 1976. Design Proposals for Reinforced Concrete Corbels. *PCI Journal*, V. 21, No. 3 (May–June): pp. 18–42.

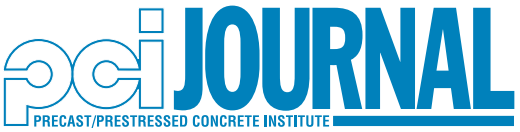
7. Mattock, Alan H. 1979. Design and Behavior of Dapped-End Beams. *PCI Journal*, V. 24, No. 6 (November–December): pp. 28–45.

8. Shaikh, A. Fattah. 1978. Proposed Revisions to Shear Friction Provisions. *PCI Journal*, V. 23, No. 2 (March–April): pp. 12–21.

9. Collins, Michael P., and Denis Mitchell. 1980. Shear and Torsion Design of Prestressed and Non-Prestressed Concrete Beams. *PCI Journal*, V. 25, No. 5 (September–October): pp. 32–100.

10. Zia, Paul, and Thomas T. C. Hsu. 2004. Design for Torsion and





Shear in Prestressed Concrete Flexural Members. *PCI Journal*, V. 49, No. 3 (May–June): pp. 34–42.

11. Seguirant, Stephen J., Richard Brice, and Bijan Khaleghi. 2005. Flexural Strength of Reinforced and Prestressed Concrete T-Beams. *PCI Journal,* V. 50, No. 1 (January–February): 44–73.

12. PCI Technical Activities Council and PCI Committee on Building Code. 1997. PCI Standard Design Practice. *PCI Journal*, V. 42, No. 2 (March–April): pp. 34–46.

13. PCI Committee on Building Code. 2003. PCI Standard Design Practice. *PCI Journal*, V. 48, No. 1 (January–February): pp. 14–30.

14. Priestley, M. J. N. 1996. The PRESSS Program—Current Status and Proposed Plans for Phase III. *PCI Journal*, V. 41, No. 2 (March–April): pp. 22–40.

15. Priestley, M. J. N., S. Sritharan, J. R. Conley, and S. Pampanin. 1999. Preliminary Results and Conclusions from the PRESSS Five-Story Precast Concrete Test Building. *PCI Journal*, V. 44, No. 6 (November–December): pp. 42–67.

16. Englekirk, Robert E. 2002. Design-Construction of the Paramount—A 39-Story Precast Prestressed Concrete Apartment Building. *PCI Journal*, V. 47, No. 4 (July–August): pp. 56–71.

17. Anderson, Neal S., and Donald F. Meinheit. 2000. Design Criteria for Headed Stud Groups in Shear: Part 1—Steel Capacity and Back Edge Effects. *PCI Journal*, V. 45, No. 5 (September–October): pp. 46–75.

18. Anderson, Neal S., and Donald F. Meinheit. 2005. Pryout Capacity of Cast-In Headed Stud Anchors. *PCI Journal*, V. 50, No. 2 (March–April): pp. 90–112.

19. Fleischman, Robert B., Clay J. Naito, José Restrepo, Richard Sause, and S. K. Ghosh. 2005. Seismic Design Methodology for Precast Concrete Diaphragms—Part 1: Design Framework. *PCI Journal*, V. 50, No. 5 (September–October): pp. 68–83.

20. Fleischman, Robert B., S. K. Ghosh, Clay J. Naito, Ge Wan, José Restrepo, Matt Schoettler, Richard Sause, and Liling Cao. 2005. Seismic Design Methodology for Precast Concrete Diaphragms—Part 2: Research Program. *PCI Journal*, V. 50, No. 6 (November–December): pp. 14–31.

21. Abeles, Paul W. 1963. Partial Prestressing in England. *PCI Journal*, V. 8, No. 1 (February): pp. 51–72.

22. Park, Robert. 1980. Ductility of Prestressed and Partially Prestressed Concrete Beam Sections. *PCI Journal*, V. 25, No. 2 (March–April): pp. 46–80.

23. Park, Robert, and D. K. Bull. 1986. Seismic Resistance of Frames Incorporating Precast Prestressed Concrete Beam Shells. *PCI Journal*, V. 31, No. 4 (July–August): pp. 54–93.

24. Park, Robert, and Pam Hoet Joen. 1990. Flexural Strength and Ductility Analysis of Spirally Reinforced Prestressed Concrete Piles. *PCI Journal*, V. 35, No. 4 (July–August): pp. 64–83.

25. Elliott, Kim S., Gwynne Davies, Halil Gorgun, and Mohammed Reza Adlparvar. 1998. The Stability of Precast Concrete Skeletal Frames. *PCI Journal*, V. 43, No. 2 (March–April): pp. 42–60.

26. Park, Robert. 2002. Seismic Design and Construction of Precast Concrete Buildings in New Zealand. *PCI Journal*, V. 47, No. 5 (September–October): pp. 60–75.

27. Priestley, M. J. Nigel. 2002. Direct Displacement-Based Design of Precast/Prestressed Concrete Buildings. *PCI Journal*, V. 47, No. 6 (November–December): pp. 66–79.

28. Staquet, Stephanie, Guy Rigot, Henri Detandt, and Bernard Espion. 2004. Innovative Composite Precast Pretressed Precambered U-Shaped Concrete Deck for Belgium's High Speed Railway Trains. *PCI Journal*, V. 49, No. 6 (November–December): pp. 94–113.

29. Rodriguez, Mario E., and Jon J. Blandón. 2005. Tests on a Half-Scale Two-Story Seismic-Resisting Precast Concrete Building. *PCI Journal*, V. 50, No. 1 (January–February): pp. 94–114.

30. Blandón, Jon J., and Mario E. Rodriguez. 2005. Behavior of Connections and Floor Diaphragms in Seismic-Resisting Precast Concrete Buildings. *PCI Journal*, V. 50, No. 1 (January–February): pp. 56–75.

31. Tanaka, Yoshiki, Hirotaka Kawano, Hiroshi Watanabe, and Tomoyoshi Nakajo. 2006. Study on Cover Depth for Prestressed Concrete Bridges in Airborne-Chloride Environments. *PCI Journal*, V. 51, No. 2 (March–April): pp. 42–55.

32. Quinlan, Michael. 2003. The Challenge of Delivering Technology to the Design Community. *PCI Journal*, V. 48, No. 5 (September–October): p. 13.

33. Matthews, Robert A. 1962. President's Message. *PCI Journal*, V. 7, No. 6 (December): p. 8.

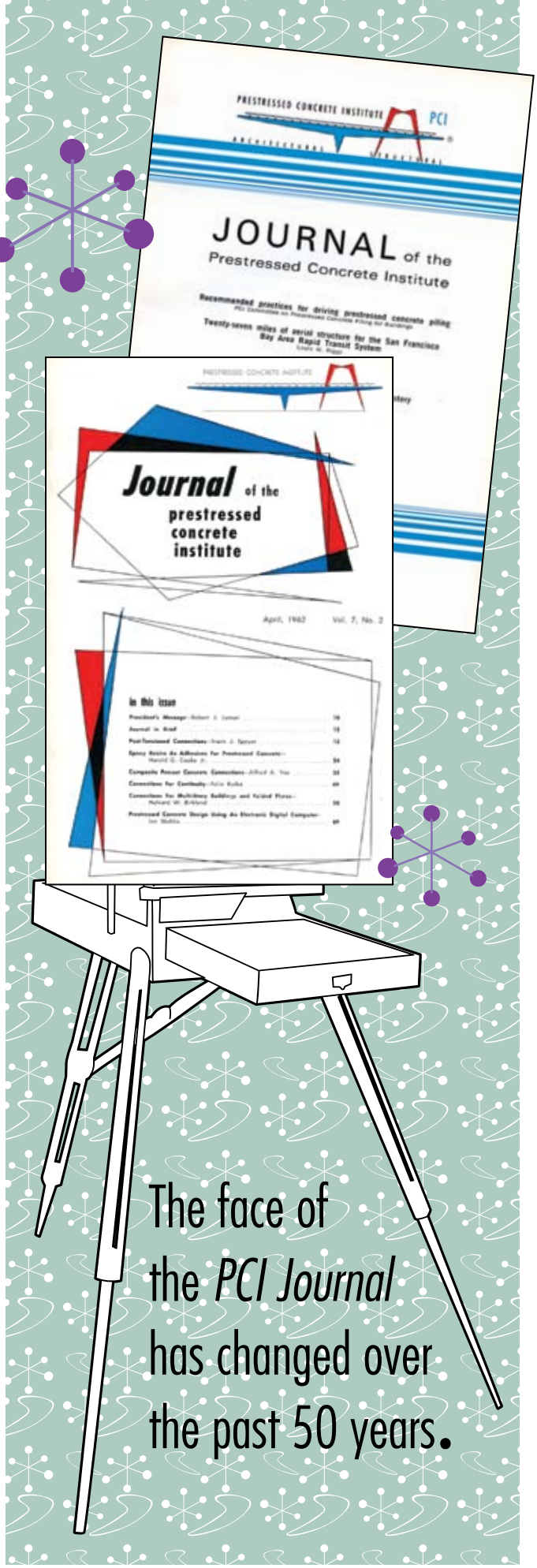
LANDMARK PAPERS

The following articles are among the landmark papers published in the *PCI Journal* during the past 50 years. This listing is given in chronological order. Several other papers are worthy of mention but are not included here due to space constraints.

- "Connections in Precast Concrete Structures—Bearing Strength of Column Heads," by L. B. Kriz and

C. H. Raths, *PCI Journal*, V. 8, No. 6, December 1963, pp. 45–75.
This article features fundamental research on column connections carried out at PCA.

- "Torsion Design of Prestressed Concrete," by Paul Zia and Thomas T. C. Hsu, *PCI Journal*, V. 19, No. 2, March–April 1974, pp. 46–65.
  This paper, which has since been updated, is recognized in ACI 318.
- "Ten Years of Experience with Precast Segmental Construction," by Jean Muller, *PCI Journal*, V. 20, No. 1, January–February 1975, pp. 28–61.
  This paper played a prominent role in popularizing precast segmental concrete bridges in North America.
- "Large Precast Prestressed Vierendeel Trusses Highlight Multistory Building," by A. Martynowicz and C. B. McMillan, *PCI Journal*, V. 20, No. 6, November–December 1975, pp. 50–65.
  A major feature of this 28-story building is the use of large architectural precast, segmental Vierendeel trusses that are post-tensioned together.
- "Prestressing the CN Tower," by Franz Knoll, M. John Prosser, and John Otter, *PCI Journal,* V. 21, No. 3, May–June 1976, pp. 84–111.
  This article shows that post-tensioning the foundation of this very tall tower is more efficient and economical than conventional mild steel reinforcement.
- "World's Largest Prestressed LPG Floating Vessel," by Arthur R. Anderson, *PCI Journal*, V. 22, No. 1, January–February 1977, pp. 12–31.
  The author discusses the concept, design, production, and towing to Indonesia of this unique precast concrete floating vessel.
- "A Rational Method for Estimating Camber and Deflection of Precast Prestressed Members," by Leslie D. Martin, *PCI Journal*, V. 22, No. 1, January–February 1977, pp. 100–108.
  The use of multipliers for estimating deflections has been a helpful aid to designers.
- "Design of Partially Prestressed Concrete Flexural Members," by Saad Moustafa, *PCI Journal*, V. 22, No. 3, May–June 1977, pp. 12–29.
  This classic paper on partial prestressing spurred interest in partially prestressed concrete.
- "Serviceability Based Design of Partially Prestressed Beams—Part 1: Analytic Formulation," by Antoine E. Naaman and Amnuayporn Siriaksorn, *PCI Journal*, V. 24, No. 2, March–April 1979, pp. 64–89.
  The authors present a rational method for the analysis and design of partially prestressed concrete beams.
- "Serviceability Based Design of Partially Prestressed Beams—Part 2: Computerized Design and Evaluation of Major Parameters," by Amnuayporn Siriaksorn, *PCI Journal*, V. 24, No. 3, May–June 1979, pp. 40–60.
  The author presents a parametric study of the principal variables affecting partially prestressed concrete beams and apply the results to standard precast sections.
- "Prestressed Concrete Ties for North American Railroads," by Amir N. Hanna, *PCI Journal,* V. 24, No. 5, September–October 1979, pp. 32–61.
  This article presents a survey of technology in prestressed concrete railroad ties in North America.
- "Shear and Torsion Design of Prestressed and Non-Prestressed Concrete Beams," by Michael P. Collins and Denis Mitchell, *PCI Journal*, V. 25, No. 5, September–October 1980, pp. 32–100.
  This contribution is the classic paper on the compression field theory.
- "Creep Analysis of Prestressed Concrete Structures Using Creep Transformed Section Properties," by Walter H. Dilger, *PCI Journal*, V. 27, No. 1, January–February 1982, pp. 98–117.
  This paper presents a simple yet accurate method for analyzing creep in uncracked reinforced and prestressed concrete structures using the aging coefficient. The method is particularly advantageous for members with multiple layers of prestressed and/or non-prestressed steel and for composite beams.
- "Kuwait's Bubiyan Bridge—A 3-D Precast Segmental Space Frame," by Walter Podolny Jr. and Antonio A. Mireles, *PCI Journal*, V. 28, No. 1, January–February 1983, pp. 68–107.
  This project represents a considerable step forward in precast, prestressed segmental bridge construction.
- "Thirty Years of Prestressed Concrete Railroad Bridges," by Donald Goldberg, *PCI Journal*, V. 28, No. 5, September–October 1983, pp. 78–111.
  This article presents the evolution of prestressed concrete railroad bridges in North America.
- "One Hundred Washington Square—Structural Design and Construction," by Robert A. Pullar, Alfred A. Yee, Chang Nai Kim, and David Pickersgill, *PCI Journal*, V. 29, No. 1, January–February 1984, pp. 24–48.
  This is a terrific design-construction article on one of the tallest precast, prestressed concrete buildings.
- "Spandrel Beam Behavior and Design," by Charles H. Raths, *PCI Journal*, V. 29, No. 2, March–April 1984, pp. 62–131.
  This paper presents common precast spandrel beam distress causes, discusses types of loads applied to spandrel beams and overall torsion equilibrium requirements, provides design relationship for spandrel beams, offers design criteria for spandrel beam connection, sets forth good design practices, and gives numerical design examples.
- "Rational Analysis and Design of Prestressed Concrete Beam Columns and Wall Panels," by Noel D. Nathan, *PCI Journal*, V. 30, No. 3, May–June 1985, pp. 85–133.
  This fundamental paper is on the design of prestressed concrete columns and wall panels.
- "Design and Construction of Linn Cove Viaduct," by Jean M. Muller and James M. Barker, *PCI Journal*, V. 30, No. 5, September–October 1985, pp. 38–53.
  More than 15,000 reprints of this article have been

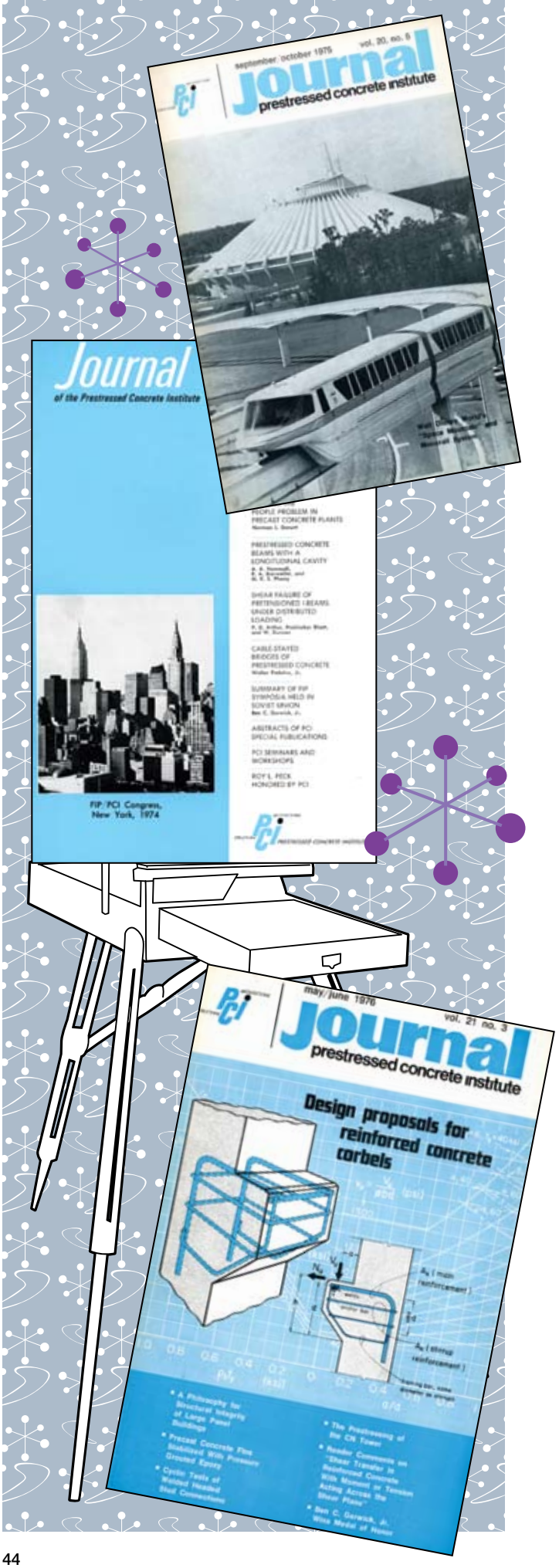


sold; it presents details about a unique precast segmental bridge in which piers were lowered from the deck for environmental considerations.

- "Giant Segmental Precast Prestressed Concrete Culverts," by R. H. (Ray) Hebden, *PCI Journal*, V. 31, No. 6, November–December 1986, pp. 60–73.
  This article describes the design-construction of three 213-ft-long precast segmental buried culverts.
- "Toward a Consistent Design of Structural Concrete," by Jörg Schlaich, Kurt Shaefer, and Mattias Jennewein, *PCI Journal*, V. 32, No. 3, May–June 1987, pp. 74–150.
  This is the classic paper on strut-and-tie modeling.
- "Olympic Oval Roof Structure—Design, Production, Erection Highlights," by Barry Lester and Herb Armitage, *PCI Journal*, V. 32, No. 6, November–December 1987, pp. 50–69.
  The authors describe the concept, design, production, and erection of the roof structure of this $27 million speedskating facility in Calgary, AB, Canada.
- "Aerial Guideway for the Vancouver ALRT Project: Part 1—Design Overview," by Terry A. Nettles, V. 33, No. 6, November–December 1988, pp. 39–52, and "Aerial Guideway for the Vancouver ALRT Project: Part 2—Construction Highlights," by Paul A. R. Lowe, *PCI Journal*, V. 33, No. 6, November–December 1988, pp. 53–85.
  These are great articles on the concept, design, production, and construction of this 10-mile-long (16 km), precast prestressed concrete, rapid transit project.
- "Lateral Stability of Long Prestressed Concrete Beams—Part 1" by Robert F. Mast, *PCI Journal*, V. 34, No. 1, January–February 1989, pp. 34–53, and "Lateral Stability of Long Prestressed Concrete Beams—Part 2," by Robert F. Mast, *PCI Journal*, V. 38, No. 1, January–February 1993, pp. 70–88.
  These papers deal with the lateral stability of long prestressed concrete girders. Without these papers, it would have been very difficult to convince DOTs that the new large bridge girders can be shipped safely.
- "Blue Cross and Blue Shield Parking Facility," by Harry Ellenzweig, M. V. Ravindra, H. W. (Bill) Hagen, and Robert J. Vitelli, *PCI Journal*, V. 35, No. 1, January–February 1990, pp. 26–36.
  This unique application shows how architectural precast concrete can be used to beautify the structural frame of a parking structure.
- "Kalispell Christian Center Church: Part 1—The Fulfillment of a Dream" and "Kalispell Christian Center Church: Part 2—The Precaster's Story," by James M. McArthur, Robert Green, and Chuck Prussack, *PCI Journal*, V. 35, No. 1, January–February 1990, pp. 38–45.
  This article describes the design-construction of a church in which roof single tees, double tees, wall single tees, sandwich wall panels, and balcony beams were utilized.
- "Union Camp Paper Machine Building: Part 1—Con-

cept and Structural Design Overview" and "Union Camp Paper Machine Building: Part 2—Manufacturing and Erection Highlights," by Bryant A. Zavitz, Roger A. Reid, Jeff Woodruff, and Mark Zirbel, *PCI Journal*, V. 35, No. 1, January–February 1990, pp. 62–75.
This article describes the design-construction of a precast, prestressed industrial building that was designed to resist unusually heavy loads and the effects of a salty environment.

- "The Florida Suncoast Dome," by Thomas J. D'Arcy, Gerald E. Goettsche, and Mickey A. Pickell, *PCI Journal*, V. 35, No. 1, January–February 1990, pp. 76–94.
This article describes the concept, design, production, and erection of this unique $100 million, precast, prestressed concrete stadium.
- "Transfer and Development Length of Epoxy Coated and Uncoated Prestressing Strand," by Thomas E. Cousins, David W. Johnston, and Paul Zia, *PCI Journal*, V. 35, No. 4, July–August 1990, pp. 92–103.
This paper exposed weaknesses in strand bond and spurred interest in further research on this topic.
- "Design Considerations for Precast Prestressed Concrete Building Structures in Seismic Areas," by Alfred A. Yee, *PCI Journal*, V. 36, No. 3, May–June 1991, pp. 40–55.
This paper covers seismic design by a world-renowned engineer.
- "Design-Construction of Detroit Metropolitan Airport Air Traffic Control Tower," by Patrick McGuire, Dennis Young, John Ciulis, and Charles E. Mayer, *PCI Journal*, V. 36, No. 6, November–December 1991, pp. 38–50.
This article describes the design-construction of a load-bearing precast airport control tower with an exposed architectural finish.
- "Design-Construction of Connecticut Tennis Center," by Joseph H. Weiss, Frank Zamencnik, Leslie D. Martin, and Mario J. Bertolini, *PCI Journal*, V. 37, No. 1, January–February 1992, pp. 22–36.
An all-precast, prestressed concrete structural frame was used for this $15 million, 15,000-seat tennis stadium.
- "Evaluation of Degree of Rusting on Prestressed Concrete Strand," by Augusto S. Sason, *PCI Journal*, V. 37, No. 3, May–June 1992, pp. 25–30.
This article presents a procedure that has since become an ASTM Standard for classifying the degree of rust in prestressing strand.
- "Performance of Prestressed Concrete Highway Bridges in the United States—The First 40 Years," by Basile G. Rabbat and Kenneth F. Dunker, *PCI Journal*, V. 37, No. 3, May–June 1992, pp. 48–64.
This is an impressive survey on the excellent durability record of precast, prestressed concrete bridges.
- "Building and Rebuilding of Philadelphia's Walnut Lane Memorial Bridge—Part 1: A History of Design, Construction, and Service Life," by Charles C. Zollman, Frank Depman, Joseph Nagle, and Edward F. Hollander, *PCI Journal*, V. 37, No. 3, May–June 1992, pp. 66–82, and "Building and Rebuilding of Philadelphia's Walnut Lane Memorial Bridge—Part 2: Demolition and Rebuilding of the Superstructure," by Charles C. Zollman, Frank Depman, Joseph Nagle, and Edward F. Hollander, *PCI Journal*, V. 37, No. 4, July–August 1992, pp. 64–82.
These articles present the chronology of this historic prestressed concrete bridge followed by the demolition of the original post-tensioned girders and their replacement with hybrid AASHTO I-girders.
- "Design and Construction of Spliced I-Girder Bridges," by Abdel Karim, M. Ahmad, and Maher K. Tadros, *PCI Journal*, V. 37, No. 4, July–August 1992, pp. 114–122.
This paper has helped expand the long-span bridge market.
- "Interstitial Precast Prestressed Concrete Trusses for Ciba-Geigy Life Science Building," by Matthys P. Levy and Tony Yoshizawa, *PCI Journal*, V. 37, No. 6, November–December 1992, pp. 34–42.
This article describes the design of an all-precast, prestressed concrete building that features Vierendeel trusses to allow for large, column-free spaces.
- "The New Texas U-Beam Bridges: An Aesthetic and Economical Design Solution," by Mary Lou Ralls, Luis Ybanez, and John J. Panak, *PCI Journal*, V. 38, No. 5, September–October 1993, pp. 20–29.
This article describes the development of an attractive open-top trapezoidal precast, prestressed concrete beam that has become a standard in the state of Texas.
- "Performance of Precast/Prestressed Concrete Building Structures during Northridge Earthquake," by James K. Iverson and Neil M. Hawkins, *PCI Journal*, V. 39, No. 2, March–April 1994, pp. 38–55.
This paper pointed out some weaknesses in the seismic design of precast/prestressed concrete structures. Some of these issues have been addressed in the codes, while others are being researched to this day.
- "Precast Concrete Homes for Safety, Strength and Durability," by M. K. Hurd, *PCI Journal*, V. 39, No. 2, March–April 1994, pp. 56–72.
This article presents the evolution of housing using precast concrete.
- "The NU Precast/Prestressed Concrete Bridge I-Girder Series," by K. Lynn Geren and Maher K. Tadros, *PCI Journal*, V. 39, No. 3, May–June 1994, pp. 26–39.
As a result of this research, a new generation of highly efficient concrete I-girders for bridges has risen. The new products can produce the same span capabilities for the same depth and the same spacing as high-performance steel plate girders. The NU I-Girder has been the only I-girder shape used in the state of Nebraska since 1994. It was shortly followed by the New England Bulb Tee, the Washington Super Girder, the Michigan Girder, the Alberta NU-Girder,

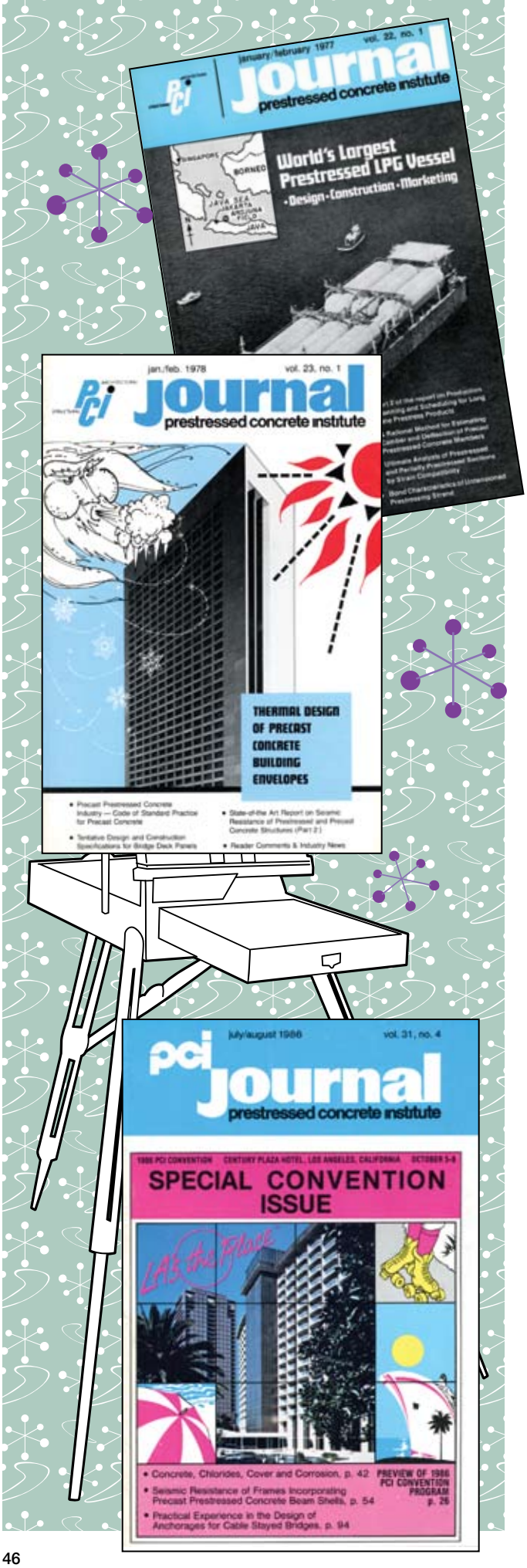


and others.

- "A New Structurally and Thermally Efficient Precast Sandwich Panel System," by Amin Einea, David Salmon, Maher K. Tadros, and Todd Culp, *PCI Journal*, V. 39, No. 4, July–August 1994, pp. 90–101.
  An original sandwich wall panel system uses carbon fiber reinforcement connectors. This study has motivated others in the precast concrete industry to use similar wall panel systems.
- "A Review of Strand Development Length for Pretensioned Concrete Members," by C. Dale Buckner, *PCI Journal,* V. 40, No. 2, March–April 1995, pp. 84–105.
  The various methods for determining the development length of prestressing strand are compared.
- "Strength of Prestressed Concrete Members at Sections Where Strands Are Not Fully Developed," by Leslie D. Martin and Walter J. Korkosz, *PCI Journal*, V. 40, No. 5, September–October 1995, pp. 58–66.
  The authors present a useful strain compatibility approach for partially developed strand and free end slip for evaluating strength.
- "Precast Prestressed Concrete—Solution of Choice for Lincoln Heights Water Tanks," by Rick Lennen, George Miller, and Chuck Prussack, *PCI Journal*, V. 41, No. 1, January–February 1996, pp. 20–33.
  This article shows how a nice-looking, functional, and cost-effective water tank can be built using a precast, prestressed concrete system.
- "Durability Aspects of Precast Prestressed Concrete—Part 1: Historical Review," by Matthew R. Sherman, David B. McDonald, and Donald W. Pfeifer, V. 41, No. 4, July–August 1996, pp. 62–74.
  This historical review covers the excellent durability of heat-cured, low water-cement ratio precast concrete.
- "Durability Aspects of Precast Prestressed Concrete—Part 2: Chloride Permeability Study," by Matthew R. Sherman, David B. McDonald, and Donald W. Pfeifer, V. 41, No. 4, July–August 1996, pp. 76–95.
  Laboratory tests confirm the importance of low water-cement ratios in the performance of precast concrete.
- "An Innovative Design Solution for Precast Prestressed Concrete Buildings in High Seismic Zones," by Robert E. Englekirk, *PCI Journal*, V. 41, No. 4, July–August 1996, pp. 44–53.
  A beam-to-column connection using a newly developed ductile rod connector was applied successfully on a four-story precast, prestressed parking structure in Los Angeles, Calif.
- "Acceptance Criteria for Bond Quality of Strand for Pretensioned Prestressed Concrete Applications," by Donald R. Logan, *PCI Journal*, V. 42, No. 2, March–April 1997, pp. 52–90.
  This paper discusses identifying critical issues related to strand bond.
- "Design, Fabrication, and Construction of the New England Bulb-Tee Girder," by Alexander K. Bardow, Rita L. Seraderian, and Michael P. Culmo, *PCI Journal*, V. 42, No. 6, November–December 1997,

pp. 30–40.
This paper provides the background partnering effort that resulted in standard bulb-tee girders for New England.

- "Precast Structures in Regions of High Seismicity: 1997 UBC Design Provisions," by S. K. Ghosh , Suzanne Dow Nakaki, and Kosal Krishnan, *PCI Journal*, V. 42, No. 6, November–December 1997, pp. 76–93.
  This excellent paper provides background and discussion of Uniform Building Code provisions and includes a practical numerical design example illustrating the code provisions.
- "Precast Prestressed Segmental Floating Drawspan for Admiral Clarey Bridge," by Michael J. Abrahams and Gary Wilson, *PCI Journal*, V. 43, No. 4, July–August 1998, pp. 60–79.
  A cellular precast/prestressed segmental concrete box pontoon was developed for this $84 million design-build project in Pearl Harbor, Hawaii.
- "Analysis of Cracked Prestressed Sections: A Practical Approach," by Robert F. Mast, *PCI Journal*, V. 43, No. 4, July–August 1998, pp. 80–89.
  A general method is given for analyzing cracked sections of any shape, including composite sections and a mix of reinforcement types.
- "New Deep WSDOT Standard Sections Extend Spans of Prestressed Concrete Girders," by Stephen J. Seguirant, *PCI Journal*, V. 43, No. 4, July–August 1998, pp. 92–119.
  New girder sections have expanded the market for precast, prestressed concrete bridges. This paper also pointed out weaknesses in the new LRFD specification, particularly in calculating prestress losses. As a result, WSDOT recommended research on this subject. This, in turn, resulted in NCHRP Report 496, which has since been adopted by AASHTO in LRFD. This result is an improved method of estimating prestress losses.
- "NUDECK—An Efficient and Economical Precast Bridge Deck System," by Sameh S. Badie, Mantu C. Baishya, and Maher K. Tadros, *PCI Journal*, V. 43, No. 5, September–October 1998, pp. 56–74.
  This article introduces a cost-competitive, full-depth, precast concrete bridge deck panel system that has been used successfully.
- "Restraint Moments in Precast/Prestressed Concrete Continuous Bridges," by Zhongguo (John) Ma, Xiaoming Huo, Maher K. Tadros, and Mantu Baishya, *PCI Journal*, V. 43, No. 6, November–December 1998, pp. 40–57.
  This article describes a new system for creating continuity for cast-in-place decks in precast, prestressed concrete girder bridges.
- "Precast Soundwall Panels Make Ideal Housing Components," by William R. Von Der Ahe, Ronald Piekarz, and Christian R. Newkirk, *PCI Journal*, V. 44, No. 1, January–February 1999, pp. 22–53.
  The authors show how existing soundwall panels were adapted to build attractive, cost-effective, two-story homes in Chicago, Ill.
- "The Tower at Namur—World's Tallest Precast Prestressed Concrete Structure," by Guy Rigot and Marie-Therese Gaspart, *PCI Journal*, V. 44, No. 3, May–June 1999, pp. 16–24.
  This article describes the design-construction of this 561-ft-tall loadbearing segmental telecommunication tower.
- "Precast Superstructure Gives Princeton University Stadium Distinctive Flair," by Rafael Vinoli, Aine Brazil, Helmuth Wilden, and Harry Gleich, *PCI Journal*, V. 44, No. 3, May–June 1999, pp. 26–35.
  The design-construction of this distinctive stadium includes triple risers, trapezoidal seating, and other special features.
- "Uniquely Curved Precast Concrete Panels Define New Center of Science & Industry (COSI)," by Arata Isozaki, Jerome Scott, Thomas Doyle, and Jerry Cummings, *PCI Journal*, V. 44, No. 5, September–October 1999, pp. 48–59.
  Authors describe the concept, design, fabrication, and erection of the curved precast, prestressed concrete wall panel and flooring system.
- "Precast, Prestressed Pedestrian Bridge—World's First Reactive Powder Concrete Structure," by Pierre Y. Blais and Marco Couture, *PCI Journal*, V. 44, No. 5, September–October 1999, pp. 60–71.
  Authors describe the concept, design, fabrication, and erection of this 197-ft-span (60 m) precast, prestressed pedestrian bridge using newly developed reactive powder concrete.
- "Loadbearing Architectural Precast Wall Panels," by Sidney Freedman, *PCI Journal*, V. 44, No. 5, September–October 1999, pp. 92–115.
  Many benefits, including structural, construction, and economic, can be derived from using loadbearing panels in buildings.
- "Preliminary Results and Conclusions from the PRESSS Five-Story Precast Concrete Test Building," by M. J. Nigel Priestley, Sri Sritharan, James R. Conley, and Stefano Pampanin, *PCI Journal*, V. 44, No. 6, November–December 1999, pp. 42–67.
  This article presents important new technology from the PCI PRESSS research program.
- "Strength Design of Pretensioned Flexural Concrete Members at Prestress Transfer," by Panya Noppakunwijai, Maher K. Tadros, Zhongguo (John) Ma, and Robert F. Mast, *PCI Journal*, V. 46, No. 1, January–February 2001, pp. 34–52.
  In this classic paper on strength design of prestressed concrete members, a major proposal is to increase the allowable concrete compression from the historical limit of $0.60\sqrt{f'_{ci}}$.
- "Design of Rectangular Openings in Precast Walls under Vertical Loads," by Michael G. Allen and Yahya C. Kurama, *PCI Journal*, V. 47, No. 1, January–February 2002, pp. 50–65.
  One of the outcomes of the PRESSS Research Program was the benefit of using post-tensioning in the



design of precast concrete walls.

- "Design-Construction of The Paramount—A 39-Story Precast Prestressed Concrete Apartment Building," by Robert E. Englekirk, *PCI Journal*, V. 47, No. 4, July–August 2002, pp. 56–71.
  The Paramount is the tallest precast, prestressed concrete building constructed in a very high seismic zone.
- "Design-Construction of Bridge Street Bridge—First CFRP in the United States," by Nabil F. Grace, Frederick C. Navarre, Richard B. Nacey, Wayne Bonus, and Loris Collavino, *PCI Journal*, V. 47, No. 5, September–October 2002, pp. 20–35.
  This article discusses the design, fabrication, and erection of this historic bridge and the monitoring testing program.
- "Seismic Design and Construction of Precast Concrete Buildings in New Zealand," by Robert Park, *PCI Journal*, V. 47, No. 5, September–October 2002, pp. 60–75.
  This article presents a roundup of some of the inventive design and construction methods being used with precast/prestressed concrete buildings in New Zealand.
- "Design and Construction of Minneapolis–St. Paul International Airport Precast Concrete Tunnel System," by Richard M. Johnson, Louis Charette, Harry Charalambu, and David Reneson, *PCI Journal*, V. 48, No. 5, September–October 2003, pp. 34–44.
  This article highlights the use of precast concrete tunnel segments in a multi-million-dollar light-rail transit project.
- "Application of the Strength Design Method for Flexural Members at Prestress Transfer," by Panya Noppakunwijai, Maher K. Tadros, and Chuanbing Sun, *PCI Journal*, V. 48, No. 5, September–October 2003, pp. 62–74.
  This method has been exclusively adopted by the Nebraska Department of Roads and has influenced the proposal to increase the allowable concrete compression of $0.60\sqrt{f'_{ci}}$ *in ACI 318.*
- "Seismic Design Recommendations for Precast Concrete Diaphragms in Long Floor Span Construction," by Robert B. Fleischman and Kenneth T. Farrow, *PCI Journal*, V. 48, No. 6, November–December 2003, pp. 46–62.
  Recommendations are given for diaphragm design strength, allowable flexibility, and ductility when subjected to seismic conditions.
- "Building Code Provisions for Precast/Prestressed Concrete: A Brief History," by Thomas J. D'Arcy, George D. Nasser, and S. K. Ghosh, *PCI Journal*, V. 48, No. 6, November–December 2003, pp. 116–124.
  This article is a historical review of the evolution of building code provisions for precast/prestressed concrete.
- "Historical Perspective on Prestressed Concrete," by David P. Billington, *PCI Journal*, V. 49, No. 1, January–February 2004, pp. 14–30.
  This meticulously documented article discusses the

origins and early history of prestressed concrete.

- "Load Testing of Prestressed Concrete Double Tees without Web Reinforcement," by Alex Aswad, George Burnley, Ned M. Cleland, David Orndorff, and Charles Wynings, *PCI Journal*, V. 49, No. 2, March–April 2004, pp. 66–77.
  Test results show that web reinforcement can be omitted from double tees under certain conditions.
- "Aurora Municipal Center's Stunning Design Showcases the Possibilities of Precast Concrete Solutions," by Paul Todd, Joseph G. Rapp, Kevin Charlson, and Dave Holsteen, *PCI Journal*, V. 49, No. 6, November–December 2004, pp. 80–93.
  Creative building design showcases an all-precast concrete solution.
- "Flexural Strength of Reinforced and Prestressed Concrete T-Beams," by Stephen J. Seguirant, Richard Brice, and Bijan Khaleghi, *PCI Journal*, V. 50, No. 1, January–February 2005, pp. 44–73.
  This influential article played a major role in changing Washington State DOT Bridge Design Manual *and* AASHTO LRFD Bridge Design Specifications.
- "Design-Construction of a Precast, Prestressed Concrete Pavement for Interstate 10, El Monte, California," by David K. Merritt, B. Frank McCullough, and Ned H. Burns, *PCI Journal*, V. 50, No. 2, March–April 2005, pp. 18–27.
  This project has demonstrated the expediency of using precast, prestressed concrete pavement construction and has generated considerable interest for further applications.
- "A Practical Method to Estimate Elastic Deformation of Precast Pretopped Double-Tee Diaphragms," by Wei Zheng and Michael G. Oliva, *PCI Journal*, V. 50, No. 2, March–April 2005, pp. 44–55.
  A practical approach is given for calculating linear elastic in-plane flexibility and lateral deformations of untopped precast double-tee diaphragms.
- "NU Precast Concrete House Provides Spacious and Energy Efficient Solution for Residential Construction," by William W. Holmes, David Kusolthamarat, and Maher K. Tadros, *PCI Journal*, V. 50, No. 3, May–June 2005, pp. 16–25.
  This skillfully designed private residence uses an all–precast concrete solution.
- "Analysis and Design for End Effects in Twisted Double Tees," by Gregory Banks, Laura N. Lowes, and John F. Stanton, *PCI Journal*, V. 50, No. 3, May–June 2005, pp. 40–59.
  This study identifies the important modes of deformation and presents an analysis of the stresses and deformations caused by twisting of double tees.
- "New Technologies Proven in Precast Concrete Modular Floating Pier for U.S. Navy," by Michael W. LaNier, Markus Wernli, Robert Easley, and Preston S. Springston, *PCI Journal*, V. 50, No. 4, July–August 2005, pp. 76–99.
  This paper describes the design, fabrication, and testing of a large-scale modular hybrid floating pier made with state-of-the-art precast/prestressed concrete technology.
- "First Use of UHPFRC in Thin Precast Concrete Roof Shell for Canadian LRT Station," by Enzo Vicenzino, Gerry Culham, Vic H. Perry, Don Zakariasen, and Terry S. Chow, *PCI Journal*, V. 50, No. 5, September–October 2005, pp. 50–67.
  This article is about the application of very high-strength ductile material for precast concrete products.
- "Achieving Sustainability with Precast Concrete," by Martha Van Geem, *PCI Journal*, V. 51, No. 1, January–February 2006, pp. 42–61.

This article provides a survey on sustainable design as it affects precast concrete.

- "U.S. Department of Transportation Facility, Lakewood, Colo.," by George D. Nasser, *PCI Journal*, V. 51, January–February 2006, pp. 76–81.
  This article shows how environmental and energy conservation guidelines, including LEED criteria, were applied successfully in a government-owned building.

SIGNIFICANT COMMITTEE REPORTS

In addition to individually authored articles, the *PCI Journal* has published many important technical committee reports in its 50-year history. The following are among the most noteworthy reports and are presented in chronological order:

- ASCE-ACI Committee 323, "Joint ASCE-ACI Report on Prestressed Concrete," *PCI Journal*, V. 2, No. 4, March 1958, pp. 28–62.
- PCI Committee on Guide Specifications, "Guide Specification for Precast, Prestressed Concrete Construction for Buildings," *PCI Journal*, V. 13, No. 1, February 1968, pp. 59–67.
- PCI Committee on Prestressed Concrete Columns, "Tentative Recommendations for the Design of Prestressed Concrete Columns," *PCI Journal*, V. 13, No. 5, October 1968, pp. 12–21.
- PCI Committee on Connection Details, "Summary of Basic Information on Precast Concrete Connections," *PCI Journal*, V. 14, No. 6, December 1969, pp. 14–58.
- PCI Committee on Allowable Stresses in Prestressed Concrete Design, "Allowable Tensile Stresses for Prestressed Concrete," *PCI Journal*, V. 15, No. 1, February 1970, pp. 37–42.
- PCI Committee on Architectural Precast Concrete Guide Specifications, "Guide Specifications for Architectural Precast Concrete," *PCI Journal*, V. 16, No. 4, July–August 1971, pp. 10–20.
- PCI Committee on Fire Resistance Ratings, "Fire Endurance of Prestressed Concrete Double-Tee Wall Assemblies," *PCI Journal*, V. 17, No. 4, July–August 1972, pp. 19–28.
- PCI Committee on Post-Tensioning, "Recommended Practice for Grouting of Post-Tensioned Prestressed Concrete," *PCI Journal*, V. 17, No. 6, November–December 1972, pp. 18–25.
- PCI Committee on Architectural Precast Concrete Joint Details, "Architectural Precast Concrete Joint Details," *PCI Journal*, V. 18, No. 2, March–April 1973, pp. 10–37.
- PCI Committee on Fire, "Fire Resistance of Architectural Precast Concrete," V. 19, No. 5, September–October 1974, pp. 18–37.
- PCI Committee on Segmental Construction, "Recommended Practice for Segmental Construction in Prestressed Concrete," *PCI Journal*, V. 20, No. 2, March–April 1975, pp. 22–41.
- PCI Committee on Prestress Losses, "Recommendations for Estimating Prestress Losses," *PCI Journal*, V. 20, No. 4, July–August 1975, pp. 43–75.
- PCI Committee on Precast Concrete Bearing Wall Buildings, "Considerations for the Design of Precast Concrete Bearing Wall Buildings to Withstand Abnormal Loads," *PCI Journal*, V. 21, No. 2, March–April 1976, pp. 18–51.
- PCI Ad Hoc Committee on Standardization of Welded Wire Fabric, "Standardization of Welded Wire Fabric," *PCI Journal*, V. 21, No. 4, July–August 1976, pp. 30–37.
- PCI Committee on Prestressed Concrete Piling, "Recommended Practice for Design, Manufacture, and Installation of Prestressed Concrete Piling," *PCI Journal,* V. 22, No. 2, March–April 1977, pp. 20–49.
- PCI Bridge Committee, "Tentative Design and Construction Specifications for Bridge Deck Panels," *PCI Journal*, V. 23, No. 1, January–February 1978, pp. 32–39.
- PCI Committee on Glass Fiber Reinforced Concrete Panels, "Recommended Practice for Glass Fiber Reinforced Concrete Panels," *PCI Journal*, V. 26, No. 1, January–February 1981, pp. 25–93.
- PCI Committee on Tolerances, "Tolerances for Precast and Prestressed Concrete," *PCI Journal*, V. 26, No. 1, March–April 1981, pp. 40–72.
- PCI Committee on High-Range Water-Reducing Admixtures, "Recommended Practice for Use of High-Range Water-Reducing Admixtures in Precast Prestressed Concrete Operations," *PCI Journal*, V. 26, No. 5, September–October 1981, pp. 28–49.
- PCI Committee on Quality Control Performance Criteria, "Fabrication and Shipment Cracks in Prestressed Hollow-Core Slabs and Double Tees," *PCI Journal*, V. 28, No. 1, January–February 1983, pp. 18–39.
- Ad Hoc Committee of the FIP Commission on Prestressing Steels and Systems, "Tentative Recommendations for the Corrosion Protection of Unbonded Tendons," *PCI Journal*, V. 28, No. 1, January–February 1983, pp. 40–49.
- PTI Ad Hoc Committee for Unbonded Single Strand Tendons, "Specification for Unbonded Single Strand Tendons," V. 30, No. 2, March–April 1985, pp. 22–39.
- PCI Committee on Quality Control Performance Criteria, "Fabrication and Shipment Cracks in Precast Prestressed Beams and Columns," *PCI Journal*, V. 30, No. 3, May–June 1985, pp. 24–49.
- PCI Committee on Building Code and PCI Technical Activities Committee, "Proposed Design Requirements for Precast Concrete," *PCI Journal*, V. 31, No. 6, November–December 1986, pp. 32–47.
- PCI Committee on Bridges, "Precast Prestressed Concrete Bridge Deck Panels," *PCI Journal*, V. 32, No. 2, March–April 1987, pp. 26–45.
- PCI Committee on Precast Prestressed Concrete Storage Tanks, "Recommended Practice for Precast

Prestressed Concrete Circular Storage Tanks," *PCI Journal*, V. 32, No. 4, July–August 1987, pp. 80–125.
- PCI Bridge Producers Committee, "Recommended Practice for Precast Prestressed Concrete Composite Bridge Deck Panels," *PCI Journal*, V. 33, No. 2, March–April 1988, pp. 67–109.
- PCI Committee on Prestressed Concrete Columns, "Recommended Practice for the Design of Prestressed Concrete Columns and Walls," *PCI Journal*, V. 33, No. 4, July–August 1988, pp. 56–95.
- PCI Bridge Committee, "Precast, Prestressed Concrete Horizontally Curved Bridge Beams," Report prepared by ABAM Engineers/BERGER Group, *PCI Journal*, V. 33, No. 5, September–October 1988, pp. 50–95.
- PCI Committee on Tolerances, "Product Tolerances for Precast and Prestressed Concrete," *PCI Journal*, V. 38, No. 1, January–February 1993, pp. 16–26.
- PCI Committee on Prestressed Concrete Piling, "Recommended Practice for Design, Manufacture, and Installation of Prestressed Concrete Piling," *PCI Journal*, V. 38, No. 2, March–April 1993, pp. 14–41.
- PCI Ad Hoc Committee on Epoxy-Coated Strand, "Guidelines for the Use of Epoxy-Coated Strand," *PCI Journal*, V. 38, No. 4, July–August 1993, pp. 26–32.
- PCI Committee on Durability, "Guide to Using Silica Fume in Precast/Prestressed Concrete Products," *PCI Journal*, V. 39, No. 5, September–October 1994, pp. 36–45.
- PCI Committee on Durability, "Alkali-Aggregate Reactivity—A Summary," *PCI Journal*, V. 39, No. 6, November–December 1994, pp. 26–35.
- PCI Committee on Precast Sandwich Wall Panels, "State-of-the-Art of Precast/Prestressed Sandwich Wall Panels," *PCI Journal*, V. 42, No. 2, March–April 1997, pp. 92–134, and V. 42, No. 3, May–June 1997, pp. 32–49.
- PCI Ad Hoc Committee on Precast Walls, "Design for Lateral Force Resistance with Precast Concrete Shear Walls," *PCI Journal*, V. 42, No. 5, September–October 1997, pp. 44–64.
- PCI Committee on Prestressed Concrete Poles, "Guide for the Design of Prestressed Concrete Poles," *PCI Journal*, V. 42, No. 6, November–December 1997, pp. 94–134.
- PCI Committee on Industry Handbook and Background and Discussion Task Group, "Background and Discussion of the *PCI Design Handbook*, Fifth Edition," *PCI Journal*, V. 43, No. 4, July–August 1998, pp. 28–40.
- PCI Committee on Connection Details, "Standard Precast Connections," *PCI Journal*, V. 43, No. 4, July–August 1998, pp. 42–58.
- PCI Committee on Prestressed Concrete Poles, "Specification Guide for Prestressed Concrete Poles," *PCI Journal*, V. 44, No. 2, March–April 1999, pp. 80–87.
- PCI High Performance Concrete Committee, "High Performance Concrete Showcase Bridges," *PCI Journal*, V. 46, No. 6, November–December 2001, pp. 42–55.
- PCI Committee on Prestressed Concrete Poles, "User's Guide for Handling, Storage, and Erection of Prestressed Concrete Poles," *PCI Journal*, V. 47, No. 2, March–April 2002, pp. 14–19.
- PCI Erectors Committee Litewall Fast Team and PCI Erectors Committee, "Recommended Practices and Procedures for the Erection of Vertical Litewalls with Corbels and Pocketed Spandrels," *PCI Journal*, V. 47, No. 3, May–June 2002, pp. 14–20.
- PCI Erectors Committee Litewall Fast Team and PCI Erectors Committee, "Recommended Practices and Procedures for the Erection of Vertical Litewalls with Corbels and Haunched Spandrels," *PCI Journal*, V. 47, No. 3, May–June 2002, pp. 22–27.
- PCI Erectors Committee Litewall Fast Team and PCI Erectors Committee, "Recommended Practices and Procedures for the Erection of Vertical Litewalls with Pockets and Haunched Spandrels," *PCI Journal*, V. 47, No. 3, May–June 2002, pp. 28–33.
- PCI Erectors Committee Litewall Fast Team and PCI Erectors Committee, "Recommended Practices and Procedures for the Erection of Horizontal Litewalls with Pocketed or Haunched Spandrels," *PCI Journal*, V. 47, No. 3, May–June 2002, pp. 34–36.
- PCI Committee on Building Code, "PCI Standard Design Practice," *PCI Journal*, V. 48, No. 1, January–February 2003, pp. 14–30.
- PCI Soundwall Committee, "Guide Specification for Reflective Precast Concrete Soundwalls," *PCI Journal*, V. 48, No. 2, March–April 2003, pp. 14–17.
- PCI Self-Consolidating Concrete FAST Team, "Interim Guidelines for the Use of Self-Consolidating Concrete in PCI Member Plants," *PCI Journal*, V. 48, No. 3, May–June 2003, pp. 14–18.
- PCI Committee on Building Code, PCI Standard Design Practice, *PCI Journal*, V. 50, No. 2, March–April 2005, insert between pp. 16–17.
- PCI Industry Handbook Committee, "Background and Discussion of *PCI Design Handbook*, Sixth Edition," *PCI Journal*, V. 51, No. 2, March–April 2006, pp. 108–115.

SPECIAL THEMATIC ISSUES

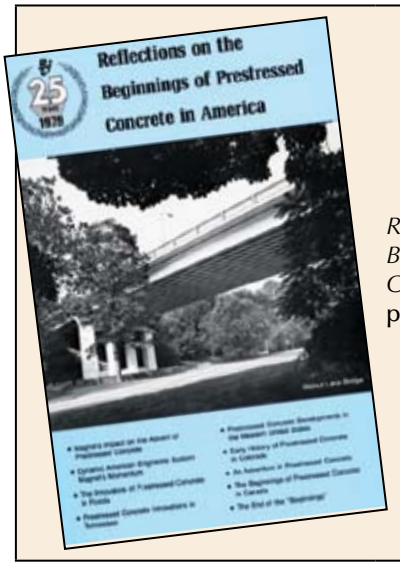
During the past 50 years, several special thematic issues have been published in the *PCI Journal*. These issues are listed in chronological order.

The series "Design Considerations for a Precast, Prestressed Apartment Building" is published in the *PCI Journal* from 1973 to 1975.

- "Design Considerations for a Precast, Prestressed Apartment Building," *PCI Journal*, V. 18, No. 6, November–December 1973 through V. 20, No. 2, March–April 1975.
  This special volume consisting of a series of eight papers first appeared in the PCI Journal. *These papers, authored by nationally prominent consulting engineers, give a step-by-step design procedure for constructing a typical high-rise precast, prestressed concrete building from conceptual planning to final erection.*

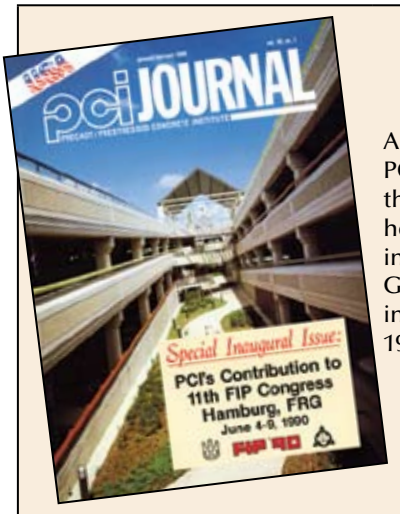
A special commemorative issue on ACI's T. Y. Lin Symposium on Prestressed Concrete is published in the September–October 1976 *PCI Journal*.

- "T. Y. Lin Symposium on Prestressed Concrete," *PCI Journal*, V. 21, No. 5, September–October 1976.
  This special volume of 12 selected papers is devoted to prestressed concrete and the contributions of T. Y. Lin.



Reflections on the Beginnings of Prestressed Concrete in America is published in 1981.

- Reflections on the Beginnings of Prestressed Concrete in America series, *PCI Journal,* from V. 23, No. 3, May–June 1978 to V. 25, No. 3, May–June 1980.
  This collection of 10 articles by industry pioneers covers the history of prestressed concrete in Europe and North America.



A preview article on PCI's contribution to the 11th FIP Congress held June 4–9, 1990, in Hamburg, West Germany, is published in the January–February 1990 *PCI Journal*.

- Special Inaugural Issue: PCI's Contribution to 11th FIP Congress, Hamburg, FRG, June 4–9, 1990, *PCI Journal*, V. 35, No. 1, January–February 1990.
  This special volume comprises design-construction articles on nine precast/prestressed concrete projects.

PRESTRESSED CONCRETE INSTITUTE

The PCI Journal *has evolved to become the primary technical and research archive of the industry. Technical information published in the* PCI Journal *has provided vital research, technical, and marketing support for PCI committees, PCI members, and the design and construction community at large.*

The May–June 1993 *PCI Journal* is dedicated to high-strength concrete.

PCI's contribution to the first *fib* Congress in 2002 is recapped in the September–October 2002 *PCI Journal* in the Chairman's Message.

- High Strength Prestressed Concrete: PCI's Contribution to XII FIP Congress, Washington, D.C., May 29–June 2, 1994, *PCI Journal*, May–June 1993.
  This special issue contains a collection of 12 papers on high-strength prestressed concrete in the United States.

- PCI's Contribution to the first *fib* Congress, 2002, Osaka, Japan—October 13–19, *PCI Journal*, V. 47, No. 5, September–October 2002.
  This collection of seven papers covers a variety of topics.
- Historical-Technical Series, *PCI Journal*, from V. 48, No. 6, November–December 2003, to the present.
  This continuing series of articles on the history of the precast/prestressed concrete industry in the United States commemorates PCI's 50th Anniversary.
- "Achieving Sustainability with Precast Concrete," "Lean Manufacturing—A Systematic Approach to Improving Productivity in the Precast Concrete Industry," "Some Aspects of Sustainability," and "Project Study: United States Department of Transportation Facility, Lakewood, Colorado," *PCI Journal,* V. 51, No. 1, January–February 2006, pp. 42–81.
  This collection of four papers provides a current analysis of sustainable design with precast concrete.