

# Applied Technology Corporation

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## **DR. ALFRED A. YEE**

*President*

Dr. Alfred A. Yee completed work for his Master's of Engineering degree in Structural Engineering under the guidance of Professor Hardy Cross at Yale University, New Haven, Connecticut. The year before he had just received his Bachelor of Science degree in Civil Engineering from the Rose-Hulman Institute of Technology in Terre Haute, Indiana. In recognition for his work in concrete technology and proven concepts for both land and sea structures, particularly in the field of precast and prestressed concrete construction, Dr. Yee was awarded an Honorary Doctor of Engineering degree from Rose-Hulman Institute of Technology in May 1976. In that year, he was also elected to the National Academy of Engineering (USA), a branch of the National Academy of Science which was originally founded by President Abraham Lincoln in 1863 for the purpose of assembling a group of scientific advisors to the President and the Congress of the United States of America.

In 1955, Dr. Yee participated in introducing the first precast, prestressed concrete mass production facility in the Hawaiian Islands. Dr. Yee personally designed the prestressing beds, concrete forms, and developed innovative structural concepts and construction techniques utilizing prestressed, precast concrete units for the construction of both low- and high-rise buildings. In the field of marine concrete vessels, Dr. Yee designed and supervised the construction of the world's first pretensioned, prestressed concrete oceangoing barges in 1964. A total of 19 barges were constructed in this program and used successfully to transport ammunition, food, fuel and other supplies between the Philippines and Vietnam during the war. The last of these barges were decommissioned after 33 years of continuous service.

Dr. Yee also developed and patented a novel structural concept for marine structures. This system utilizes reinforced concrete in the form of an integrated cylindrical cell honeycomb core in composite action with prestressed top and bottom slabs and side walls which can produce a structure with maximum strength and rigidity with the least amount of construction material. The prestressed honeycomb system was utilized commercially for the first time on the award winning ROFOMEX I, a floating platform designed to support a large phosphate processing plant.

ROFOMEX I, which measures 260 feet long x 110 feet wide x 24 feet deep, was constructed in Singapore, launched and towed 10,000 miles across the Pacific Ocean to Baja, California where it was outfitted for use as a floating platform supporting a mobile phosphate processing facility.

Due to the inherent strength of the concrete honeycomb, this system was incorporated into the first mobile concrete island drilling system (SUPER CIDS) used for offshore oil exploration on the North slope of Alaska. Prior to this concept, offshore exploration drilling required the construction of artificial gravel islands to withstand the extreme high pressures generated by arctic winter ice flow conditions. However, gravel islands are expensive to build and maintain and are environmentally unfavorable. Furthermore, should a dry hole result from the exploratory drilling, the gravel island not being mobile must then be abandoned, and the supporting drilling facilities and equipment on the island must then be removed. With the mobile concrete drilling system, initial investment is considerably lower and the platform facility can be relocated and reused in various locations at minimum cost. This mobile platform facility has proven itself by continuous service for nearly two decades without any sign of damage, wear or deterioration and has developed a reputation of being the most economical method of oil exploration in Arctic offshore environment.

Dr. Yee has also developed unique systems for splicing and joining precast components which are widely utilized throughout the world on many high-rise and civil engineering structures. In addition, he has developed numerous original concepts in mechanical equipment design to transport and erect heavy long span prestressed concrete beams in the construction of high-rise buildings.

During the past twenty-five years, he served on technical committees of various national engineering societies such as the American Concrete Institute, Prestressed Concrete Institute, American Society of Civil Engineers, and the American Bureau of Shipping. In recognition of his technical contributions towards the advancement of engineering, he was awarded honorary memberships in the American Concrete Institute and the American Society of Civil Engineers, the highest recognition accorded to any member of these societies.

For seven consecutive three-year terms, he has served as honorary structural consultant to the Singapore Housing Development Board (HDB) to assist in the initiation and direction of a major program for industrializing high-rise building methods. This program involved introduction of construction systems utilizing mass-produced prefabricated concrete components to accelerate housing construction in Singapore. Dr. Yee assisted in the development of design and construction criteria and in the training of structural engineers and technicians for this program. The training program also involved methods of design, construction, quality control, materials research, precast concrete plant production and field erection. To date, the HDB has built thousands of high-rise housing blocks utilizing precast concrete technology.

In 1997, Dr. Yee was awarded the Medal of Honor by the Prestressed/Precast Concrete Institute for his extraordinary contribution to the industry.

In 2004, Dr. Yee was named a Titan of the Precast/Prestressed Concrete Industry in recognition of his outstanding contributions to the Industry; for prominence in industry innovation and change; for positive leadership in industry-altering development and expansion; and for advancing and accelerating the growth of the North American Precast and Prestressed concrete industry.

In 2007, Dr. Yee was appointed to the International Panel of Experts by the Building and Construction Authority (BCA) of Singapore to assist in the effort to review and strengthen its regulatory framework.

More recently, Dr. Yee's office served as structural engineering consultants for a completed 25-storey office building in Beijing, China; a completed 43-storey precast concrete office building in Dalian City, China; a residential complex involving 18 ten-storey precast structures; a major precast concrete aircraft hangar housing two B2 bombers completed in June 2005 and awarded the ASCE Outstanding Civil Engineering Achievement Award for "Design/Build AEF FOL Aircraft Maintenance Hangar and as Structural Concept Engineer for a high-rise residential complex including a 70-storey and 63-storey precast concrete structures.

Of particular interest, Dr. Yee has been granted patents on his numerous inventions including the following:

- Kwik Slab System, U.S. Patent No. 7,134,805
- Precast Concrete Slab System and Method Therefor, U.S.A. Patent No. 7,134,805
- Method of Post-Tensioning Steel/Concrete Truss Before Installation, U.S. Patent No. 5,299,445
- Long Span Post-Tensioned Steel/Concrete Truss and Method of Making Same, U.S. Patent No. 5,305,572
- Splice Sleeve for Connecting Reinforcing Bars to Another Entity, U.S. Patent No. 5,230,199
- Prestressed Concrete Hull and Method of Making Same, U.S. Patent No. 3,324,814.
- Method of Rebottoming Metal Hull with Reinforced Concrete, U.S. Patent No. 3,306,245.
- Splice Sleeve for Reinforcing Bars, U.S. Patent No. 3,540,763.
- Wire Cage Type Splice Sleeve for Reinforcing Bars, U.S. Patent No. 3,552,787.
- Concrete Construction, U.S. Patent No. 3,613,325

- Floating or Submerged Marine Vessel for Storage, Support or Transport, U.S. Patent No. 3,833,035.
- Marine Vessel with Vertical Annular Walls, U.S. Patent No. 4,011,826
- Splice Sleeve for Reinforcing Bars with Cylindrical Shell, U.S. Patent No. 4,627,212
- Splice Sleeve for Overlapping Reinforcing Bars, U.S. Patent No. 4,692,052
- Precast Concrete Tanks & Methods of Making Same, UK Patent No. GB 2 169 339

#### AWARDS AND RECOGNITION

- First president of American Concrete Institute, Hawaii Chapter, 1961-1962
- Martin P. Korn Award - 1965, Prestressed Concrete Institute
- Engineer of the Year - 1969, Hawaii Society of Professional Engineers
- First president of Structural Engineers Association of Hawaii, 1969-1970
- Selected by the construction industry (McGraw-Hill Publications Company) in 1970 as one of the "Men Who Made Marks in 1970" for his contribution as structural innovator with his time-saving precast concrete structure for the Ala Moana Hotel in Honolulu, Hawaii
- Elected to the National Academy of Engineering, 1976
- Honorary Doctor of Engineering, Rose-Hulman Institute of Technology, 1976
- Honorary Member, American Concrete Institute, 1977
- Robert J. Lyman Award - 1984, Prestressed Concrete Institute for three-part report on "One Hundred Washington Square," PCI Journal, January-February 1984
- First Honorary Member, Cement and Concrete Products Industry of Hawaii, 1985
- Appointed to the American Arbitration Association's Panel of Arbitrators, 1986
- Honorary Member, American Society of Civil Engineers, 1987
- State-of-the-Art Award - 1991, Precast/Prestressed Concrete Institute for "Design Considerations for Precast Prestressed Concrete Building Structures in Seismic Areas," PCI Journal, May-June 1991
- Fellow, Precast/Prestressed Concrete Institute, 1995
- Medal of Honor, Precast/Prestressed Concrete Institute, 1997
- Titan, Precast/Prestressed Concrete Institute, 2004
- Appointed to the International Panel of Experts, Building & Construction Authority of Singapore, 2007

#### PROFESSIONAL REGISTRATIONS

- Professional Engineer, Hawaii, 1953 (Structural)
- Professional Engineer, California, 1963 (Civil)
- Professional Engineer, Guam, 1963 (Structural)
- Professional Engineer, Texas, 1972
- Professional Engineer, Singapore, 2000 (Civil)

#### MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

- American Society of Civil Engineers, Fellow, Honorary Member, Life Member
- American Concrete Institute, Fellow, Honorary Member
- Earthquake Engineering Research Institute
- International Association for Bridge and Structural Engineering
- National Society of Professional Engineers, Life Member
- Post-Tensioning Institute
- Prestressed/Precast Concrete Institute, Life Member
- Singapore Concrete Institute
- Society of Naval Architects and Marine Engineers

- Structural Engineers Association of Hawaii
- Yale Engineering Associations, Fellow

#### PROFESSIONAL COMMITTEES - PAST

- American Bureau of Shipping (ABS) Special Committee on Offshore Installations
- American Concrete Institute (ACI) Committee 357, Concrete and Marine Offshore Structures
- ACI-ASCE Committee 512, on Precast Structural Concrete
- PCI Committee on Connection Details
- PCI Committee on Seismic Design
- PCI Committee on Titan Selection
- Precast Seismic Structural Systems (PRESSS), Advisory Committee Member
- Post-Tensioning Institute (PTI), Technical Advisory Board (TAB) Member
- American Arbitration Association, Panel of Arbitrators
- Member of Blue Ribbon Panel, San Francisco International Airport Authority, to assist in the evaluation and selection of structural concepts for proposed major offshore runways in San Francisco Bay
- PCI Committee on Journal Awards, 1995-2007

#### PROFESSIONAL COMMITTEES - PRESENT

- PCI Technical Review Committee
- International Panel of Experts, Building & Construction Authority of Singapore, 2007

#### PUBLICATIONS

*"Composite Application of Prestressed Concrete Units in Building Construction,"* Proceedings of 27th Annual Convention, Structural Engineers Association of California, October 1958

*"Prestressing at Work in Hawaii,"* by Alfred A. Yee and Charles W. Watson, Journal of the Prestressed Concrete Institute, September 1960

*"High-Rise Structures in Hawaii Combined Precast, Poured Concrete,"* Architectural Record, October 1961

*"Construction of Multi-Story Prestressed Concrete Buildings in Hawaii,"* Proceedings of the University of California Western Conference on Prestressed Concrete Institute, 1962

*"Composite Precast Concrete Connections,"* Journal of the Prestressed Concrete Institute, April 1962

*"Connecting Precast Concrete,"* Architectural and Engineering News, April 1962

*"Commentary - Uniform Building Code, 1961 Edition - Earthquake Regulations,"* Hawaii Civil Engineer, June 1962

*"The Domino System for High-Rise Buildings,"* Journal of the Prestressed Concrete Institute, December 1964

*Discussion of paper entitled "Special Problems of Tall Buildings (Shear Walls, Stability of Columns, Effect of Thermal Gradients, Construction Problems)"* by Raymond C. Reese and E.A. Picardi, delivered to the 8th Congress of the International Association for Bridge and Structural Engineering and Symposium on Wearing Surfaces for Steel Bridge Decks of Lightweight Construction, New York, September 1968. Published in English, German and French in the Final Report of the 8th Congress of the I.A.B.S.E.

*"The Column Tree Framing System for High Rise Buildings,"* Proceedings Structural Engineers Association of California, 38th Annual Convention, Hawaii, 1969

*"Design Considerations for a Precast Prestressed Apartment Building - Design for Erection Considerations,"* co-authored with Fred Masuda, PCI Journal, November-December 1974

PUBLICATIONS (Continued)

"*Design and Construction of Oceangoing Pretensioned Concrete Barges*," given before American Concrete Institute 1974 Annual Convention in Honolulu, Hawaii, Journal of the American Concrete Institute, April 1975

"*Design Considerations and Configurations: The Yee Concept*," Proceedings of an intensive five-day course, "Concrete Ships and Vessels" held September 15-19, 1975 at the University of California, Berkeley

"*Prestressed Concrete for Buildings*," PCI Journal, September- October 1976

"*Operational Experience with Prestressed Concrete Barges*," co-authored with Pablo N. Sare, presented before The Concrete Society and Royal Institution of Naval Architects, London, March 1977

"*Prestressed Concrete Barges and Floating Platforms*," presented at the Petroleum, Exploration, Drilling, and Pipeline Equipment Exhibition Seminar, January 31 - February 2, 1978, Mexico City, Mexico

"*Current Engineering and Construction Practices in China*," presented to the Western States Conference of the Structural Engineers Association, May 25, 1979, Maui, Hawaii

"*The Superiority of Concrete Honeycomb Construction for Marine Structures*," presented at the First Symposium on Arctic Drilling Platforms, Los Angeles, California, October 7, 1982

"*Honeycomb Units for Barges and Floating Platforms*," Structural Engineering Practice: Analysis, Design, Management, Volume 1, Number 1, 1982

"*One Hundred Washington Square: Structural Design and Construction*," co-authored with Chang Nai Kim, PCI Journal, January-February 1984

"*Concrete Module for the Global Marine Concrete Island Drilling System*," co-authored with Fred R. Masuda, Chang Nai Kim and Dean Doi, presented at the FIP/CPCI Symposia, Calgary, Alberta, Canada, August 25-31, 1984

"*Seismic Considerations for Precast Concrete Construction*," presented at the Seminar on Precast Concrete Construction in Seismic Zones, Japan Society for the Promotion of Science/National Science Foundation, October 29-31, 1986, Tokyo, Japan

"*Design Considerations for Precast Prestressed Concrete Building Structures in Seismic Areas*," PCI Journal, May-June 1991, Vol. 36, No. 3

"*Precast Design and Construction Solutions*," presented at the International Housing Conference, Singapore, May 23-26, 2000

"*Precast Design and Construction Solutions (Keynote Paper)*," CONSPECTUS, Technical Journal 2000, Structural Engineering Department, Housing & Development Board, Singapore

"*Social and Environmental Benefits of Precast Concrete*," PCI Journal, May/June 2001, and to be published in the CONSPECTUS, July 2001 quarterly journal by the Housing & Development Board, Singapore

"*Structural and Economic Benefits of Precast/Prestressed Concrete Construction*," PCI Journal, July-August 2001