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ACE

Thousands of inner-city students are being introduced to the fields of architecture, construction and engineering through the ACE Mentor Program

By TERRY DOOLEY (BS 54)

Ricardo Zendejas is well on his way to a successful career in civil engineering. In June he graduated from the University of California, Los Angeles, (UCLA) with a bachelor's degree in Civil/Structural Engineering, and he is now working toward a master's degree in Design/Construction Integration at Stanford University. Along the way, Ricardo has benefited from the encouragement, mentorship and opportunity provided by volunteers from the ACE Mentor Program.

Ricardo's road into engineering originated on one of the crowded high school campuses of the Los Angeles Unified School District and passed through two years at California State Polytechnic University, Pomona, before he reached UCLA. Through the years, volunteers from the architecture, construction and engineering professions advised him, encouraged him, and helped him land an internship at Pankow Builders in Pasadena. Like thousands of inner-city high school students across the country—many of them from groups under-represented in engineering and families in which they are the first to graduate from high school—Ricardo is an ACE Mentor Program success story.

I introduced the ACE (Architecture, Construction, Engineering) Mentor Program to the Los Angeles metropolitan area in 2002, just as I was retiring from a 48-year construction career on the West Coast. Since then I have been helping to build the ACE program as a volunteer.

ACE introduces inner-city high school students to professionals from these fields and shows students how to follow in their footsteps. I was the initial Chairman for ACE in Los Angeles and now serve as Secretary of its Board of Directors.

The program has two principal aims: help to produce the next generation of design and construction professionals, and open doors for urban youth to opportunities they might not otherwise know about or know how to access. In Los Angeles, 80 percent of the ACE student population is from what typically are considered minority groups. About half are women.

Founded in 1994 in New York City, the ACE Mentor Program now has spread nationally to 110 cities with about 10,000 active high school students. The program operates by linking teams of a half-dozen professionals in the ACE disciplines with about two dozen upper-level high school students. In the Los Angeles model, because of the geographic spread of the region, most teams are built around high schools or small clusters of schools. Teams meet every two weeks from October through May, after school hours. The meetings are sometimes at the

school but more often at professional offices, construction sites and universities. In other cities, including New York and Chicago, teams are built around specific professional offices, with students traveling from multiple schools. In some cities the program meets every week, but for a shorter time, usually November through April. There are the same 15 or 16 meetings per academic year.

In autumn the model is "show-and-tell," with professionals demonstrating what they do and telling what education and experience it took to get there. The students visit professional offices and construction sites. Some of the mentors are minority group members with links to the inner-city. In spring the team works on a design/budget problem assigned by local ACE leadership. In 2008, the Los Angeles teams determined a specific new building need or renovation need on their own school campuses.

They then designed, modeled and budgeted, with mentors' help, structures that fit to scale within the footprints of their school sites. The work of all the teams was



Participants in the ACE Mentor Program concentrate on a bridge-building project.

ACE Mentor Program:
www.ACEmentor.org
ACE Los Angeles:
www.ACEmentor.org/579



displayed at the Annual Awards Banquet this summer at the Los Angeles Convention Center, for a crowd of approximately 700 people, about evenly divided between paying professional donors and students, parents and teachers.

The national founder of the ACE Mentor program is Charles B. Thornton, also a founding partner of Thornton Tomasetti Inc., an international consulting firm of civil and structural engineers. In 2001, I recruited Thornton to be the keynote speaker at the annual meeting of the Earthquake Engineering Research Institute in Long Beach, Calif. Before breakfast was finished on the day of his speech, he had in turn recruited me to start the ACE

The 2008 ACE awards banquet, held at the Los Angeles Convention Center.

Program in southern California. Those familiar with the apostolic zeal of Charlie Thornton for the ACE Program will understand.

When we started the program in southern California in fall 2002, we were in three high schools with 45 ACE students. Nine were seniors. In May 2003 each senior was awarded the right to a small scholarship if he or she documented entrance into a college level program in one of the ACE disciplines. In the second year, the program's reach was extended to a total of six high schools. May of 2004

saw 23 students awarded the right to college scholarships of \$1,000 per year for a maximum of four years, always predicated on demonstrated progress. Today there are 18 mentoring teams involving about 350 high school students from 24 high schools in three counties. Approximately 115 professionals from a wide array of design, construction and education disciplines now volunteer as mentors in the Los Angeles area. About 70 firms are involved. Prominent among them are DMJM, Turner Construction, Parsons Corporation, Gruen Architects, Jacobs Carter Burgess, Perkins + Will, John A. Martin Associates, Thornton Tomasetti and Clark *Continued on the next page*

About the writer

I grew up in South Bend, Ind., and earned a B.A. in English and Philosophy from St. John's University, Minn. Then my new wife, Kathleen, and I moved to Champaign-Urbana, where after a year as an architecture student, I earned my bachelor's degree in civil engineering.

After graduation, we moved west. I was employed for the next 26 years at locations up and down the coast by the construction divisions of Bethlehem Steel Corporation. My work was principally in the fields of field-erected structural steel and field-installed reinforcing bars. During these years I helped build the first "ductile moment resisting space frames" of reinforced concrete in Los Angeles, breaking the old 160-foot height limit. This advance was based on a seminal book, "Design of Multistory Reinforced Concrete Buildings for Earthquake Motions" by John Blume, Illinois' own Nathan Newmark, and Leo Corning. During my time with Bethlehem, I earned a master's degree from UCLA, in its Engineering Executive Program.



Terry Dooley

Moving to general contractor Morley Builders of Santa Monica, Calif., in 1981, I spent the next 21 years helping to develop the company. For the last six years before retirement, I was a principal in the pre-construction planning and then the building of a five-structure complex: The Cathedral of Our Lady of the Angels in downtown Los Angeles. The cathedral is believed to be the largest building in California built of exposed colored architectural concrete. Extensive research went into mix designs, placing and curing techniques, and sealing compounds, all intended to lengthen service life and to maintain consistent color. The building and its associated campanile are seismically base-isolated. The project won a 2003 national Merit Award from the American Society of Civil Engineers as an Outstanding Civil Engineering Achievement.

Among other principal activities were early applications of seismic base isolation to the upgrading of existing buildings, and extensive work in the seismic repair and retrofit of structures, especially after the Northridge

quake of 1994. I have continued an advisory role in those fields via committees of the Earthquake Engineering Research Institute, the American Concrete Institute and the Applied Technology Council. I am an Honorary Member of the Structural Engineers Association of Southern California, and a Fellow of ASCE and of the American Concrete Institute (ACI). I was co-recipient (with Dennis Drag) of a 1991 "Award For Innovation" from ASCE for work in seismic base isolation, and recipient of the Roger Corbetta Award from ACI in 1997 "for contributions to the advancement of construction techniques in seismic repair and retrofit of concrete buildings."

I have served on departmental advisory boards at California Polytechnic State University, San Luis Obispo, and California State Polytechnic University, Pomona. I am past president of the Architectural Guild, a support group for the School of Architecture, University of Southern California, and now serve as an occasional tutor and counselor for students at the School of Engineering and Applied Sciences, UCLA.

My wife, Kathleen, and I live in Sherman Oaks, Calif., and have six children and 12 grandchildren. —T.D.



ACE Mentor Program

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Construction.

At the 2008 Annual Awards Banquet, rights to \$1,000 college scholarships were granted to 74 graduating high school seniors. Over six years, the Los Angeles program has offered 254 scholarships of \$1,000 each to graduating high school seniors entering 30 different colleges and universities. Re-application for scholarship continuation in the college sophomore year and above is contingent on presentation of a college transcript and a class enrollment schedule for the next academic term in one of the ACE disciplines. The awarding of scholarships also is dependent on the availability of funds; a necessary corollary is a vigorous fund-raising program.

The first two "classes" of ACE students are the only ones that would be expected to produce college graduates by 2008. These two classes produced 32 scholarship-eligible students. At this writing, eight of these have received bachelor's degrees from four-year universities. Three more are expected to graduate soon. This makes the successful college graduation rate about one-third of graduating high school seniors in the program: 11 of 32. Universities that have graduated students from ACE Los Angeles include the University of California, Davis; UCLA; California Polytechnic State University, San Luis Obispo; and Santa Clara University. ACE Los Angeles students are in good standing at the Massachusetts Institute of Technology and the University of Michigan.

A growing statistical record shows that more than 90 percent of those high school seniors offered scholarships claim the money in the first year. This drops to 50 percent in the second college year, and then holds steady at about 35 percent over the final two years. Those who drop out along the way get at least a taste of higher education and might return later. ACE Los Angeles leadership is trying to improve retention by increasing the number of internships and by linking mentors and students personally in a continuing

relationship. Beginning in fall 2008, a "Sponsored Scholarship Program" began linking scholarship donors to specific students. Thirty college upperclassmen and women are receiving \$2,000 each through this program for the 2008-2009 academic year.

Many ACE students come from households in which the parents may not have finished high school. The student is often the first in his or her household to seek higher education, and some are forced out of college to contribute to the support of their families. After our Awards Banquet last June, a tearful mother and father each gave me a hug and told me in halting English that the program had redirected and inspired their son.

Throughout my own life, my path has been shaped by the inspiration and mentorship of talented engineers. My grandfather, Charles Dutton Terry, earned his bachelor's degree in mechanical engineering from the University of Illinois in 1897. His class was among the first to study in brand-new Engineering Hall. During the summer of 1952, I found myself working on the second floor of this same building as a draftsman with the Bridge Division of the Illinois Highway Department. I was at the time an undergraduate in the architecture program, and I was fortunate to be in daily working contact with an elite group of engineers, including John Haltiwanger (MS 48, PhD 57); Gene Daily (MS 51); Narbey Khachaturian (BS 47, MS 48, PhD 52), now CEE Professor Emeritus; graduate student Sabih Sami; and Tom Leahey (BS 52, MS 54). Before the summer was over, they had presented me with transfer forms and facilitated the switch from architecture to engineering that has illuminated my professional life ever since.

Today I volunteer nearly full-time for the ACE Mentor Program, working from an "emeritus" office donated to the program by Morley Builders. It's a wonderful job, paid for by the smiling faces and bright futures of Ricardo Zendejas and others like him. After he gets his master's at Stanford, perhaps we can show Ricardo the way to Urbana. ■