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## Encouraging Potential Structural Engineers

By Jesus Orozco and Matt Barnard, P.E., S.E.

*Jesus Orozco joined ACE in 2007 and joined Degenkolb in 2008 as a senior in high school. He is currently attending Santa Monica College and plans to transfer to Cal Poly San Luis Obispo and major in civil engineering with a focus in structural engineering. Jesus can be reached at [jorozco@degenkolb.com](mailto:jorozco@degenkolb.com).*

*Matt Barnard, P.E., S.E. joined Degenkolb in 2001. His experience includes structural analysis, seismic evaluation and structural design, retrofit design of existing structures, and new building design. Matt can be reached at [mbarnard@degenkolb.com](mailto:mbarnard@degenkolb.com).*



As structural engineers, we are one part of a design and construction industry that provides great service to our communities. Ironically though, it seems that many of our youth do not know about or dream of joining any one of the many rich and rewarding careers available, whether as an architect, structural engineer, construction manager, electrician, mason, plumber, etc. It appears that many of our youth aspire to become doctors, lawyers, athletes, video game designers, singers or the latest reality TV star, just to name a few. But there are also young men and women whose only hope is to avoid the traps of gang life and crime that surrounds them in their neighborhoods.

As a child, I dreamt of being a train engineer, operating one of the thundering locomotives of the Santa Fe Railway that rolled through my hometown. In middle school, I was convinced that I wanted to be an architect after reading a book on Frank Lloyd Wright. While in high school, a very influential and memorable teacher inspired me to pursue chemistry and teaching after I took her challenging but very engaging AP chemistry course. This changed my career plans considerably. A year later, I entered the University of California, Davis committed to becoming a university professor in chemistry. It was only through good fortune that I became friends with a group of engineering majors and eventually pursued a civil engineering degree, then went on to earn a Master of Science in Structural Engineering from the University of Illinois at Urbana-Champaign.

The fundamentals of my story are not unique. Many of us considered different careers when we were growing up, then something happened along the way that launched us into a career where we have the privilege of designing structures and making a lasting contribution to our

communities. As a group, we cannot wait to see if future generations will be similarly inspired to pursue a career in structural engineering. We must be proactive and be that spark ignites passion in someone, and inspires them to join us in making a difference in our communities by being structural engineers.

It is critical that new talent enter the structural engineering field and the design and construction industry behind us. It is absolutely relevant to us all. Young men and women are needed to carry on the proud tradition of the structural engineering community, designing the infrastructure and the buildings that house our society and provide sanctuary against the powerful forces of nature. Likewise, young men and women are needed to define the architecture and build these structures. Fortunately, the ACE Mentoring Program gives each of us a way to inspire youth to learn about and pursue careers in the construction industry and structural engineering.

ACE (Architecture, Construction and Engineering) is a unique partnership among industry professionals who work together to attract young people to design and construction-related professions. Architects, interior designers, landscape architects, mechanical, structural, electrical, environmental and civil engineers, construction managers, college and university representatives and other professionals from related corporations and professional organizations are all involved. Started in 1994 in New York and then formed as a not-for-profit organization in 2002, ACE has





a presence in more than two hundred cities in America – from New York to Los Angeles, Seattle to Miami, Chicago to Dallas, even Honolulu – and is still growing. Thanks to the dedication of ACE's mentors and staff, and the support of local schools, more than 60,000 students, many who are economically challenged, have had an opportunity to explore the design and construction industry.

ACE consists of a collection of small mentor/student teams organized into Affiliates that cover different portions of the country. While the national organization provides a general direction and infrastructure for the entire program, each Affiliate operates relatively independently with control of their own operations and aspirations. Over the course of the school year, each mentor team gives the participating high school students on their team an introduction into the different facets of the design and construction industry through construction site visits, office visits, a project and other activities. All three aspects of ACE – architecture, construction, and engineering – are highlighted at various points during the year. The meetings are typically every other week in the late afternoon after school. There is no set curriculum, only general guidelines for the mentors to consider when developing their program for the year. There is no cost to the students to participate in the program, except for their time and effort.

Degenkolb Engineers, the nation's oldest seismic engineering firm, is an active contributor to the ACE Mentoring Program from Seattle down the West Coast to San Diego. Their Los Angeles office became involved in 2005 when they were invited by the construction firm Charles Pankow Builders, Ltd. to give a presentation to the ACE team at Roosevelt High School about what is a structural engineering. The very next year, Degenkolb were taking on the leadership of the ACE team at Belmont High school. The Belmont team has now evolved into the Downtown Los Angeles Team, with 20 to 40 students each year from up to four different local high schools. The Los Angeles offices of Degenkolb Engineers, the architecture firm Perkins+Will, and general contractor Swinerton Builders form the current Downtown Los Angeles mentor team.



I have personally expanded my involvement and I'm now serving my fifth year on the Los Angeles Metro Area Affiliate's Board of Directors, and my second year on the regional council appropriately named the California Council. The Los Angeles Metro Area Affiliate covers both Los Angeles County and Orange County, with fifteen active teams and the goal to dramatically increase our number of teams in the next few couple of years. To complement the regular slate of team meetings, our program includes the All-Schools Event where we have a yearly pasta building contest on the campus of Sci-Arc, a Trades Day where the students are treated to a day of hands-on activities under the supervision of the instructors of a local training center, and the End-of-Year Presentation Event where each team presents their project and scholarships are awarded. The California Council is a collection of representatives of each Affiliate in the state and will be offering our second annual ACE Summer Camp on the campus of Long Beach State July 15<sup>th</sup> through July 22<sup>nd</sup>.

The reason for Degenkolb's involvement in ACE goes way beyond the extensive networking opportunities in our relationship-driven industry and the public speaking opportunities it offers participating mentors. If you can capture the attention of thirty teenagers in the late afternoon on a school night, even with the smell of freshly delivered pizza and the competition of cell phones chiming announcing the latest text message from their friends, then you know you are in good shape for your next client meeting.

The reason to be involved is Jesus Orozco and all of the young men and woman like him who have been involved in ACE. Jesus was a



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young man that I met when the Downtown LA team first appeared on the campus of Los Angeles School of Global Studies. We have been blessed to watch this young man grow from being an unfocused high school student into a committed college student realizing his potential and a valued member of the Degenkolb family. First joining us as an office assistant, Jesus has progressed until now he is indispensable to the success of our office. His story is best told in his own words.

Jesus is why I am involved in ACE. Rarely is there something that is truly a win for all involved. ACE is one of those special things where the students, the schools, the design and construction industry as a whole, and



## A Student's Perspective

By Jesus Orozco

Former ACE Student & Staff Assistant at Degenkolb Engineers

*I come from a community where it is perfectly normal to stop attending school, have a child at an early age, and where joining a gang seems to make sense. I fortunately have both of my parents present and supportive, but there are many cases where the only support comes from the streets. I know these people that cause police sirens to go off. I played on the monkey bars with people that now flood drugs into the streets; I knew them in their innocence. I return to this neighborhood every night, still unable to help. There are so many ways to go down the wrong path.*

*When I first heard about the ACE Mentoring Program at my school, I knew it would be something I definitely wanted to be a part of. At the first meeting, Matt was talking about the overview of the program; meeting with professionals, going to job sites, participating in various competitions between schools and many other activities. When it was over, some of my friends and I grabbed applications on our way out. We talked about the program all day. Turning in that application was the best decision I have ever made in my life.*

*Every Wednesday afternoon for the two years I was in the program, I would gather up my teammates after school and head down to our meetings. My favorite project was designing a train system that ran between all of the schools that were part of the Los Angeles ACE team. On my part of the project, we had the train dive into the side of a hill. (Since our project's budget was as big as our imagination, we had no problem making it work!) This project may have been hypothetical, but it was not so far-fetched. Each and every team member could potentially become an architect, engineer, or contractor. We may be the designers and construction team behind the structures of tomorrow. It didn't take long to realize that the construction industry was not only where I wanted to be, but where I needed to be. I now know that I can make a difference in this industry.*

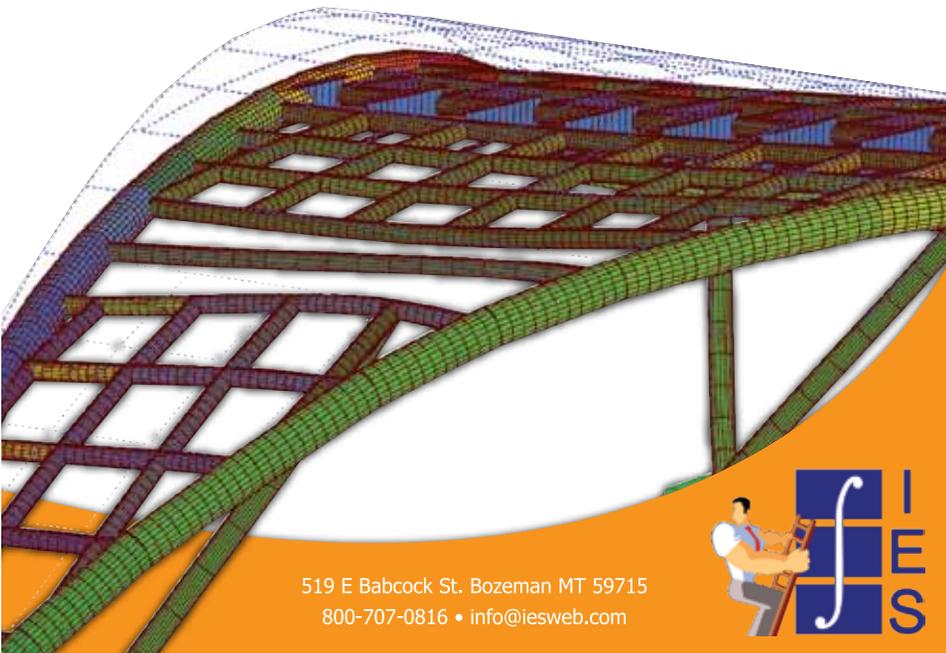
*Many times during my trips back home from meetings or from my job at Degenkolb today, I've seen many of my friends who are stuck in a hole that they may never escape. Some of them even knew about ACE but didn't take advantage of the opportunities it offered. Quite a few of them still ask if I'm still working with Degenkolb. When I respond that I am, the usual response I get is: "I wonder where I would have been if I would have taken it more seriously."*

*Because of ACE and meeting Matt, I have now been with Degenkolb Engineers going on four years. I started as an office assistant before I graduated high school and now am a staff assistant and part-time drafter. I contributed to various projects, including a hospital which I used to pass every day on my way to school. That is the best part of this industry: seeing projects you have worked on being erected. There is still much to learn in this industry and there are many seats to be filled. My personal goal now is to one day become a mentor myself and do the best I can to make sure other students have the same great experiences and opportunities I had. It really is life changing.*

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the individuals serving as mentors all benefit immensely. And this benefit is clearly demonstrated by the numerous success stories. The ACE Mentoring Program was even recognized with the nation's highest award for mentoring when the program was honored with a 2010 Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring.

I would be remiss if we did not acknowledge the challenges that the ACE program faces. The following are just a few of the challenges that we have experienced:

- Always a challenge even in good times, ACE is dependent on fundraising that often consists of donations from design and construction industry firms, many of which have been hit hard by the current economic environment.
- ACE is challenged by the critical need for an on-campus champion for schools participating in the program, whether in the faculty or administration. The ACE teams often struggle without champions promoting the program on the school campus, securing transportation and resources given the challenges faced in school budgets, and committing to chaperon the students during the after-school activities.
- Having a deep and diverse bench of mentors is critical for the success of the program, but there are intense pressures on the availability of the professionals serving as mentors. The meetings

often occur after school but still within typical working hours, making it challenging for mentors to balance work commitments and participation in the program.

- Keeping the students engaged for the duration of the program is difficult as there is extensive competition for the

students' after school hours, including family life, work, athletics and other academic commitments.

Even with these challenges, the program continues to grow. There is no better reward than the personal satisfaction of seeing a young man or woman discover a passion for our industry and embark on a path that will help them realize their potential to better of our communities and our industry.

If you are looking to make a difference, consider becoming involved in your local ACE affiliate. If you are not sure of whom to contact, visit the ACE national website at [www.acementor.org](http://www.acementor.org) and you can find the location and contact info for the Affiliate local to you.■

This article consists solely of the opinions of the authors and was written independent of the ACE Mentor Program. Thank you to Terry Dooley who founded the program in Los Angeles; his passion for ACE drives us forward. Thanks to Jesus Orozco for sharing his story, Mark Day of John A. Martin & Associates for photographs, and Ryan Mangindaan of Verten Media for photographs.



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