

# The Industry Advisory Council and the Del E. Webb School of Construction at Arizona State University

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As technology and construction methods have changed, advice from the construction industry has become important in keeping academia and graduates of the program current. Unfortunately, many universities are slow to accept the increased requirements for educating and hiring construction professionals. Without the construction industry's direct involvement with the university, some academic administrators are hesitant to invest in construction education. Industry is instrumental in helping construction management programs realign themselves within the University systems; the construction industry must actively support local construction programs and demand more resources for construction management programs. The Industry Advisory Council (IAC) has been a powerful resource for the Del E. Webb School of Construction (DEWSC) at Arizona State University (ASU). It has given advice and support, knowledge of the needs of the modern, highly technical industry, and funds to ensure that the School has the resources it needs. In turn, the School has given to the industry the results of its research and the educated constructors the industry needs. This paper traces the development of the School's industry relations from 1987 to the present, covering the joint initiatives, financial efforts, and the IAC's support. It recounts the successes and the lessons learned in establishing and running academic outreach programs

**Key Words:** Industry Advisory Council, Industry-Education Alliances

## Introduction

Budget constraints, an exploding student enrollment and technological advances, a growing public awareness of ecological problems, and international competition, all at a time that construction as an academic program has been trying to gain a foothold in institutions of higher education, have made it necessary for educational programs to seek alliances with the business world. Industry is necessary for funding, for advice to stay current to what is happening in the "real" world, and the resources and clout necessary to compete on all fronts (Adcox, 1993).

This paper recounts the tremendous, beneficial impact the Construction Industry Advisory Council (IAC) has had on the growth and success of the Del E. Webb School of Construction (DEWSC) at Arizona State University (ASU). It will also, hopefully, serve as an inspiration to other educational construction programs to establish their own alliances with industry and will provide ideas they can use in their endeavors to establish such alliances.

## **Background**

The ties between the construction industry and the ASU construction program have always been strong. Indeed, the program exists because leading contractors in Arizona in the late 1950's lobbied the State Legislature to create a construction program at one of the three state universities. Arizona State University (ASU) was selected to be the site of the program.

The first classes were offered in 1972. A number of industry leaders supported the construction program, largely through giving advice and suggestions to keep the curriculum current to the needs of the industry. The committee, however, was not a formal organization.

The American Council for Construction Education (ACCE), ASU's construction program's accreditation body, was a consistent driver for the construction program at ASU to work closer with industry. The ACCE Visitation Report (1983) maintained that although the strong tie between the ASU construction program and industry was commendable and beneficial, a more formal, organized industry committee was needed.

### *Lesson Learned*

**Close industry relations are essential for continued success in re-accreditation.**

Following the advice of the ACCE, the industry committee was formalized in 1983 under the name Construction Education and Research Council. Its mission was to "advance or initiate programs of education, research and service" to benefit the Construction Industry and the public it serves. The Council, which served, in the main, as an advisory board, initiated a fund-raising effort for a building program that was abandoned in 1994 when ASU determined that an Applied Science Center would not be built. With the approval of the donors, the construction department retained for later use the funds that had been collected.

### **Construction Industry Advisory Council (IAC)**

In raising the funds for the Applied Science Center the Council displayed a great deal of resourcefulness, knowledge of who the "movers and shakers" were, organization, and dedication to the professionalism of the industry. In its relationship with the Department (at the time), however, it was limited by its structure to merely advising and to helping raise funds for special projects. It seemed to members of the Council and the administrators of the construction program that, if the program were to be the "world-class" program they envisioned, the Council and the Department needed to be more actively involved with each other.

To achieve a program that would integrate industry, the Department, the students, and the community, the organization was re-engineered in 1988. Its name was changed to the Construction Industry Advisory Council (IAC) to emphasize its service as an active advisory council working on empowering the academic program and improving the quality of the graduates entering the construction industry. Recognizing that the integration and the determination of goals and what committees were required would determine the success of the

alliance (Adcox, 1993), the Council appointed a Peer Evaluation Committee to evaluate the program and to prepare a report that would provide new direction. The Committee recommended a peer review by two leaders (Brown, 1988 and Rodgers, 1988) from competitive programs who recommended:

1. Recruit at the high school and community college levels.
2. Continue working for graduate and research programs.
3. Develop funding sources by obtaining on each contractor's license a surcharge to be used in university research.

### *Lesson Learned*

#### **Learn from the competition.**

#### *Setting Goals and Objectives*

The Executive Board developed a five-year Strategic Plan, a marketing awareness program, to supplement the five-year plan of the Department of Construction. The purpose of the Plan was to identify those areas in which the IAC could provide financial support to the program. The plan identified a number of areas requiring extra financial support (IAC, 1990):

1. Recruitment. Increase the number and the quality of the students enrolled in the program.
2. Tenured Faculty. Expand the faculty base with additional academically qualified and work-experienced tenure track faculty.
3. Augmentation Faculty. Establish at least one chair, sponsored by the construction industry, for a distinguished professor of construction. Too, establish an industry financial support fund to provide supplemental funding to that provided by the State.
4. Laboratories. Upgrade and maintain the Surveying Lab renovation program, surveying equipment, and expendable supplies. An Estimating Lab was also needed.
5. Departmental office and system network. Upgrade all of the systems and the network, and automate the departmental office.
6. Hall of Fame Award. Recognize and honor those who have given outstanding dedication and service to the Department and to the construction industry.
7. Graduate level scholarships.
8. Graphics and surveying. Fund a graduate assistant to teach construction graphics and surveying.
9. Continuing education. Develop plans for a continuing education program for the construction industry.

The ambitious plan for the construction program required extensive fund raising. The IAC recommended that the initial funding for the total Plan come from the income earned on the investment of donations contributed to the Department of Construction for the building project. It was believed that the reliance on the use of investment income would diminish over a three-year period as increased funds were generated from private and university sources for the support of the proposed activities (IAC, 1990).

## *Increasing Enrollment*

The Council determined that the Construction Program had to increase its student enrollment and consistently upgrade the quality of incoming freshman and, therefore, of the program's graduates. It was necessary, therefore, to appeal to the best and brightest students by improving the construction industry's image and to show the opportunities available in the industry. Two committees, Marketing and Recognition and Recruitment, were appointed to evaluate and to make recommendations for a recruitment program.

### *Marketing Plan Committee*

The committee prepared a marketing plan to promote the Department and to help in recruitment. The committee focused on defining potential customers (target audience), the media that would be used to reach the target audience, and the deliverables that would be produced by the program.

#### Target audience:

- High School and community college students, parents, math and science teachers, and counselors
- Industry:
- Potential employers and partners in research
- College Advisory Council
- Construction excellence partners
- Other programs within the university
- National professional organizations
- Governmental agencies that fund construction research
- Construction Alumni
- University level other faculty, staff, & decision makers (president, provost, dean)
- Arizona Board of Regents (ABOR) and State Legislature

#### Media:

- The News Media (Nationally & Locally), Newspapers, TV, Radio, & National Journals
- World Wide Web Users (Review the web home pages to ensure quality control)

#### Potential products:

- Graduates ( BS & MS ) to serve in the industry
- Enhancing technology transfer through research collaboration
- Continuing professional education
- Driving economic development through support of high technology
- Research reports from programs and publications
- Service to industry
- Service to national and local governments

### *Recognition and Recruitment Committee*

As one of the objectives of the committee was to improve the public image of construction, one of the first tasks undertaken was to determine that construction professionals should be known as "constructors" rather than "contractors."

The committee further recommended that an annual dinner serve as an outreach program to which area high school and community college counselors and math and science teachers could invite interested students. The purposes of the industry-sponsored banquet are to improve the image of the construction industry and to inform the banquet guests of the career opportunities in the industry and the superior education available in the ASU construction program. As Table 1 shows, the banquet has been a great success, with the number of attendees limited only by the accommodations available. Funds raised by the event are used throughout the year for recruitment.

Table 1

#### *Construction Recognition Banquet History*

<b>Year</b>	<b>#</b>	<b>Keynote Speakers</b>	<b>Organization</b>	<b>No. Attending</b>	<b>Income</b>	<b>Theme</b>
1989 (April)	First	Tom Mack	Bechtel Corp.	285	\$ 9,000	Recognition
1990 (April)	Second	Vernie Lindstrom	AGC	380	\$19,700	Women
1990 (Oct) (for 1991)	Third	Eddie Basha	ABOR	480	\$19,500	Industry Support
1991 (Oct)	Fourth	Richard Tucker	CII	520	\$24,550	The Construction Industry
1992 (Oct)	Fifth	Jerry Colangelo	Phoenix Suns	538	\$21,270	Team Building
1993 (Oct)	Sixth	Ernest Harroll	USACE General	580	\$29,050	Minorities
1994 (Oct)	Seventh	Ted Kennedy	BE&K	550	\$21,300	A Dynamic Team
1995 (Oct)	Eight	Denise Norberg	ASA	589	\$30,000	Alumni
1996 (Oct)	Ninth	Dan Bennet	NCCER	557	\$29,900	Students
1997 (Oct)	Tenth	J. Doug Pruitt	Sundt Corp	582	\$33,000	Construction: an excellent career
1998 (Oct)	Eleventh	Thomas Schleifer	Schleifer's Consulting	600	\$36,000	Construction beyond the hard hat

The banquet offers three types of sponsorships:

1. Patron Sponsor for \$1,000. The sponsor also gives a \$250 educational grant that is awarded from a drawing the night of the banquet. The sponsor receives four tickets for company representatives.
2. Gold Sponsor for \$500. The sponsor receives four tickets to the dinner.
3. Silver Sponsor for \$250. The price includes two tickets for company representatives.

Awards presented at the Recognition Banquet may include:

*Outstanding Woman in Construction Award.* Co-sponsored by ASU and the Greater Phoenix Chapter of the National Association for Women in Construction (NAWIC). The purposes of the award are to promote women in construction and to improve the

recruitment and enrollment of women in construction education (29). The program is fulfilling its purposes: enrollment figures show that the DEWSC enrollment of women has grown from 5 percent of the student enrollment in 1988 to 13 percent in the fall of 1998.

*Outstanding Minority Contractor Award.* Co-sponsored by the National Association of Minority Contractors (NAMC), Phoenix Chapter, and ASU, the award was established to recognize minorities to improve the recruitment of minorities. The criteria for nomination and election to the award, and the benefits received, are similar to those for the Outstanding Woman in Construction. In the fall of 1998 minorities accounted for approximately 17% of the DEWSC student body.

***Lesson Learned***

**Marketing diverse role models is an excellent way to recruit diverse students.**

*PLUS ONE Award.* Established to honor individuals committed to the School, the IAC, and industry.

*Hall of Fame Award.* Established to honor those who have shown great commitment and dedication to the industry, the School, and to construction education.

***Lesson Learned***

**The Hall of Fame and the Plus One awards are beneficial in recognizing professionals who perform outstanding service to the program.**

*Outstanding Alumni Award.* An award to honor alumni for achievements in industry, continued support to the School, and contributions to the community.

*Measurement of success*

Undergraduate student enrollment has increased from 209 in 1988 to 262 during the fall of 1998. The recruitment of quality undergraduate students has certainly been successful. Of the 265 undergraduates enrolled in the construction program during the fall of 1997, 46 of them, or 17.3%, made the Dean's List/Honor Roll. Of the 250 students enrolled in the spring of 1998, 43 students, or 17.2%, made the Dean's List/Honor Roll. The DEWSC has generally had one or two students enrolled in the Honors Program during any given semester, and in AY 1997-98, five were enrolled. Forty-six undergraduate students attended DEWSC on scholarship during Academic Year 1997/1998, and 51 scholarships totaling \$105,000 were awarded for AY 1998/1999. Scholarships are awarded on the basis of academic achievement.

### *Lessons Learned*

- **The banquet is an outstanding marketing tool, reaching into the local high school and community colleges.**
- **It provides a good platform to have the industry work with the School and to celebrate the construction industry's many successes,**
- **It provides a superb forum to market the School and to celebrate the many achievements of the School,**
- **It offers the opportunity to present awards for outstanding service and achievement.**
- **Target audiences should include quality students, parents, student suppliers, industry, industry employers, local & national professional associations, peer programs, potential faculty, alumni, and college & university decision makers.**
- **Industry representatives market better than academia; industry, therefore, should be involved in marketing.**
- **Each program needs a recruiting tape, good brochures, publications, and the World Wide Web (WWW) network.**
- **Deliverables are graduates, publications, research results, continuing education, WWW pages, and recognition.**

### *Increasing Research*

Research forms a vital link between a university and industry, which needs graduates who have modern management techniques, new technologies, and a cultural understanding they can take into an increasingly global industry. The program of any educational program is greatly enhanced by research. Graduate students assist the faculty in accomplishing faculty goals and desires. They serve as research assistants and teaching assistants to help the faculty with research, publications, and classroom duties, freeing the faculty member from some of the tasks which can be performed by assistants, allowing the faculty to leverage their time and become more productive. Graduate students are also valuable to the faculty in assisting with research. The knowledge gained from research is incorporated into undergraduate classes. Thus, the entire educational and industrial communities gain from research and a graduate program.

The Graduate Program Committee was established to institute a graduate program in construction at ASU. On July 19, 1991, ABOR approved a Master of Science with a major in Construction, with three areas of concentration: Construction Management, Construction Science, and Facilities Management (IAC minutes, Sept. 12, 1991). Here, too, the efforts of the IAC in marketing and recruitment, the funding of resources, including faculty and equipment, and the support of the DEWSC Alumni Association, which retains representation on the Council, have borne fruit: 77 students are now enrolled in our graduate program. The quality of the graduate student, like that of the undergraduate, is improving; last year, five of our graduate students were Fulbright scholars.

As was expected, research activity has greatly increased (see PBSRG and CREATE, below). Research expenditures per faculty member averaged AY the 1997-98 AY. Among the many research topics are: Cemented Soils: excavation and deep foundations, effect of wetting; Green Building; Geotechnical Construction: compaction and demolition; Computer aided

constructability; Construction equipment productivity; Neural network applications to construction; Women in construction; and the use of GIS/GPS in concert with construction.

### *Expanding Resources*

The Funding Committee was established with two goals in mind:

1. Fund additional faculty to support the new mechanical and electrical construction options
2. Obtain space and equipment for a micro-computer laboratory, laboratories for mechanical and electrical construction and for building materials, and a student technical study area.

In the spring of 1991 a classroom was converted to lab space, providing an upgraded computer lab and an expanded student area. Then, in early 1995, funded largely by the efforts of the IAC, the laboratory was remodeled into a state-of-the-art, multi-use laboratory that could be used as a study and individual work laboratory as well as a classroom with hands-on learning capabilities. Purchases included 14 multimedia workstations; one HPJ200 workstation which could be used for geographic information systems and other applications requiring large computation power; high capacity external disk drives to allow applications to be easily moved from one machine to another; three printers; estimating software packages; a digital, high definition video/still camera for developing multimedia applications; a color printer; and a page scanner. The network server was upgraded to handle the increased size of the network and to make it faster and more reliable.

To support the expansion in curriculum and number of students, one full-time, tenure track faculty member has been added to the staff as well as one adjunct faculty and three faculty associates. In addition, the Eminent Scholars program supports an Eminent Scholar in Residence, a full-time professor, and brings at least one Visiting Eminent Scholar to the campus each summer. The Scholars' experience, knowledge, and reputation add value, recognition, and excellence to the construction education program and to ASU. The Visiting Eminent Scholars, from either/or academia or industry, have lectured at both the undergraduate and graduate level, have supervised graduate research, and are experienced in conducting seminars for industry professionals. The Visiting Scholars teach one graduate-level construction course and, through the Alliance for Construction Excellence (ACE), present at least one workshop to industry professionals during one summer session.

### *Lessons Learned*

**The Eminent Scholar program imports knowledge and introduces innovation into the School and University.**

**Students and faculty gain new points of view.**

**With knowledge gained, faculty are able to develop new courses.**

**The program is a superb marketing event that reaches international markets.**

### *Lobbying for a Construction License Surcharge*

The Political Action Committee was established in response to the peer review committee's recommendations to get a state bill requiring a surcharge of \$50 on each construction license

issued in Arizona. The funds generated would be used to fund construction research projects proposed by the construction professors, with the research findings to be distributed to the industry. Three attempts to pass such a bill have been defeated. A fourth attempt to pass such a bill is underway.

*Lesson Learned*

**The IAC is not, and should not be, a lobbying organization. Outside help is needed.**

*Developing a Curriculum to Meet Changing Needs*

Through the years the Council has kept academia informed of the realities of the “real-world” construction industry and has offered suggestions about the curriculum. An important curriculum concern of the IAC was ensuring that the School offers courses that meet the needs of changing technology. The Specialty Option was added in 1988 to provide a program for students interested in such areas as mechanical, electrical, air conditioning, roofing, concrete, commercial and industrial refrigeration, fire protection systems, utility contracting, quarrying, and land development or other specialty areas. In January 1997 the IAC recommended two additional courses in the mechanical and electrical specialty option. The course in electrical and mechanical *estimating* was approved for the 1997-98 academic year. The course in electrical and mechanical *project management* was approved as an omnibus course, a test course that is designed to determine if the students have sufficient interest in such a course to justify adding the course to the regular curriculum. The Residential Construction option was also added to the undergraduate curriculum.

At the request of the IAC, the School has offered Cleanroom Construction, which covers the programming, design, and construction for today’s fast-moving, high-tech, cleanroom construction process (see ACE), since the Spring of 1996.

Also since 1996, *all* construction students are required to take a total of 21 semester hours in business-related courses, 12 hours of which are taken through the College of Business (COB). Besides the mandatory courses in the options, the majority (80%) of construction students takes nine additional semester hours in Business. Further, in alliance with the COB the School offers a minor in business and/or a certificate of entrepreneurship to construction students willing to add to their curricula 12 semester hours of business courses developed for the construction program.

*Lesson Learned*

**The construction industry wants more business courses, not more engineering or design courses, even when construction companies are doing more engineering.**

*Developing an Internship Program*

For a number of years, some members of the IAC had expressed concern about construction students graduating with somewhat unrealistic expectations of at least their first job after graduation (IAC minutes, July 13, 1989). The IAC Curriculum Committee suggested developing

an internship program to give the students field experience prior to graduation (IAC Curriculum Committee minutes, Sept. 30, 1996). A study was made to determine pay ranges for interns and the range of tasks and duties that could be assigned to interns. It was further determined that each intern should be assigned a mentor and should have a program of periodic evaluation. Providing support to the program, member companies of the IAC committed to hiring 10 interns during the summer of 1997 as a pilot project. At present, data is being collected to assess students' level of expertise and at what level they should be apprenticed. The program is also awaiting funding that will allow a full-time coordinator.

### *Continuing Education*

#### *Alliance for Construction Excellence (ACE)*

The IAC Executive Committee, during 1990-1992, recognized the need for creating and running an industry outreach program (continuing education) to transfer the knowledge gained from the research program to industry. The challenges of having industry and academia work as partners indicated:

1. The School needed to create an environment in which industry could have part ownership of the program.
2. Participation of a broad base of the industry was critical.
3. The idea would first have to be marketed to industry and then to University decision-makers.
4. The new organization, the Alliance for Construction Excellence (ACE), needed planning, space, membership, staff, and leadership, all without state funding. The IAC provided much of the planning, membership, volunteer staff, and leadership. The College of Engineering and Applied Sciences (CEAS) provided space.
5. ACE would need deliverables and small successes to establish its credibility and to grow.
6. The faculty would have to support and participate in the alliance.

ACE was established to provide a forum for the construction industry and users of the construction process. It was to provide broad, nonpartisan access to both university and industry resources and was to facilitate assimilation of technological changes and research innovations into the industry, providing a resource to identify, define, and seek solutions to industry problems (Badger, June 11, 1991).

#### *Lesson Learned*

**Because of the close ties between academia and the industry outreach program, the program has to be physically co-located with the academic unit.**

ACE was to be a coalition of contractors, subcontractors, researchers, owners, designers, educators, manufacturers, suppliers, and other industry participants. Its program would provide for the creation, collection, analysis, management, and dissemination of information critical to the health and growth of the industry. IAC envisioned ACE as a "significant opportunity to "invest in the future of the construction industry"(IAC minutes, Sept. 12, 1991).

One objective of ACE was to become self-supporting through a multifaceted funding base that included (ACE minutes, Dec. 4, 1992): 1) Membership fees; 2) Projects that would produce direct support in the form of funding for salaries and equipment needed to execute project work; 3) Indirect funding in the form of mark-up on direct costs; 4) Fees charged for training programs; and 5) Gifts, grants, and endowments from industry and foundations. To be a founding member a company would pay an original sum of \$5,000. Sustaining members would pay \$2,500 annually (Badger, 1991). Ten companies served as founding members of ACE (ACE minutes, Dec. 4, 1992). One year after organizing, the Alliance had a membership of 22 (ACE minutes, Dec. 4, 1992). Within the first year-and-a-half of ACE's operations it was named the Western Hub of the Construction Industry Institute (CII) and in 1997 was named the Western Hub of the National Center for Construction Education and Research.

*Lessons Learned*

- **There are currently few outreach models available to construction educators.**
- **The CII model is more engineering and large-company based than is ACE.**

*Task Forces.* ACE's Business Plan (1992) established five Task Forces, each of which had deliverable, defined milestones that would serve as measurements to assess progress, and a sunset date. Co-ownership was critical to a successful, integrated outreach program; each task force had industry and academic co-chairs.

*Lesson Learned*

**Co-chair each activity with Industry and Academia.**

The task forces have changed to meet the technological demands of the industry. Since 1996, ACE has supported two Task Forces:

*Cleanroom Construction.* The purpose of the task force is to study the programming, design, and construction of the high-tech cleanroom construction process. The interest in this task force led to the development of a graduate course in cleanroom construction. The successful formation of this task force demonstrated the benefit of ACE as an outreach program. The Alliance was available to market, recruit member professionals as students, and to arrange for faculty adjunct.

*Design-Build.* This Task Force was created to further education, training, and research in the design-build process now being used throughout the private and, more recently, the public sector of the construction industry.

*Lesson Learned*

**An existing outreach program enables academia to react quickly and professionally to industry's request(s) for service.**

In 1996, growth of the program and a positive cash flow allowed the DEWSC/IAC to hire a full-time director and staff. In the same year, ACE grew to more than 100 member companies. By the beginning of the summer of 1997, ACE had 111 members. During AY 1997/98, ACE conducted seminars, workshops, and short courses for 502 participants.

#### *Performance Based Studies Research Group (PBSRG)*

One of the original ACE Task Forces, Research for Performance Based Studies Research Group (PBPSRG), was declared an IAC subcommittee in 1995. The mission of the PBRSG is to “create, operate, and make available a national database of construction industry performance information” by providing a new information environment through teaching, collecting, analyzing, and disseminating performance information (PBSRG, 1995). Ninety-five percent of the work is in the field with the research sponsors as partners. The information and delivery systems have been tested in roofing, janitorial, and landscaping services.

#### *Construction Research and Education for Advanced Technology Environments (CREATE)*

The Advanced Technology Facility Construction (Cleanroom) Task Force, a task force developed by the DEWSC at ASU in conjunction with industry representatives, identified the need for this center. The focus of the industry/university cooperative research center is the development and implementation of a complete research program that covers the entire life cycle of the construction process, from programming, design, construction, and startup of the production facilities to the start of manufacturing. The concept is to identify those factors that impact project management, schedule, and/or that cost the most, and to develop an overall value analysis to reduce the time of facility delivery, from inception to operation. The objectives of the proposed Center research program are in line with the National Technology Roadmap for Semiconductors (NTRS) and developments in the international arena.

#### *Lesson Learned*

- **The performance philosophy is gaining wide industry acceptance.**
- **Some in academia and industry are slow to accept change.**
- **The philosophy of service to the industry is a superb step in the information and technology transfer process and should lead to project research.**

#### *Seminars and Conferences*

Besides the CII and Eminent Scholars seminars, ACE sponsors and coordinates The Sheet Metal and Air Conditioning Contractors’ National Association (SMACNA) conference. This executive training program and the SMACNA graduate program are annual events for ACE. ACE also regularly sponsors cleanroom and design-build workshops. One-time seminars have included a Governor’s Conference on Partnering in the Public Sector and a North American Construction Summit.

## The IAC Today

At the March 4, 1994, meeting of the membership of the IAC, the Executive Board presented new bylaws to establish a more business-like approach and to house the actual work of the IAC at the committee level. Under the new by-laws and subsequent amendments, membership in IAC is held to a maximum of 75 individuals. Membership consists of four academic members and representatives of constructors and subcontractors, owners, and construction industry support services. Membership, at a nominal fee, continues to be by invitation.

The purposes of the IAC, to promote and improve the construction profession by education and by defining and developing the body of knowledge, are met by the following objectives:

1. Advance and support the highest quality faculty, educational facilities, and undergraduate and graduate programs for the students enrolled in the Del E. Webb School of Construction.
2. Provide a liaison between the construction industry and the Del E. Webb School of Construction and the College of Engineering and Applied Sciences.
3. Develop and implement innovative programs to benefit the Del E. Webb School of Construction and the construction industry.
4. Offer advice and counsel and provide vision for the Del E. Webb School of Construction.

### *Goals and Objectives*

Preparing for a February-March 1993 visit for reaccreditation, the School reviewed the five-year goals the program established in 1987 and found that all goals, i.e., increase enrollment of quality students, establish a graduate program, and create an industry outreach program, had been met. It was time, therefore, to formulate new goals (revised 1996):

1. Produce well-educated, knowledgeable baccalaureate graduates possessing technical, managerial, and communications skills based on academic and field experience, who can contribute at a high level of productivity to the construction industry;
2. Provide a high-quality, graduate-level program that complements the undergraduate curriculum and that enhances the capabilities of those moving into the upper positions of the construction industry, as well as provide a source of future educators;
3. Obtain sponsored project funding and perform leading-edge research that will provide benefits to the construction industry through innovative technology;
4. Operate a dynamic technology transfer and continuing education outreach program with the construction industry.

### *Lesson Learned*

**Joint planning improves the academic strategic plan, gets the faculty thinking outside the academic “box,” and gets industry’s buy-in to the program.**

*The latest Strategic Plan, 1995, iterated the following goals (IAC minutes, May 26, 1995):*

1. Enhance the community's awareness of the School's successes, capabilities, and plans for the purpose of seeking help with endowments, research, and scholarships.
2. Increase industry involvement through ACE (current and new members).

*The goals are accomplished by:*

1. Identifying "deliverables" (what DEWSC has to offer potential donors and the construction industry)
2. Documenting current successes of the School through measuring the achievements of School graduates over a five to ten-year period
3. Identifying current and future funding requirements to enable the School to get specific with marketing messages to the industry for other funding sources
4. Identifying funding sources
5. Developing an aggressive, innovative awareness campaign to increase long-term recruitment, industry involvement, and national prominence.

*To meet the objectives, the School:*

1. Uses scholarships to recruit high school graduates in the upper 5 percent of their high school classes.
2. Encourages students to maintain a 2.50 GPA instead of a 2.25. Students with poor grades require a significant amount of time and effort on the part of the staff and faculty. The resulting reduced time available to teach the top-notch students has a downward spiraling effect on a class. Material cannot be covered as thoroughly as the professor would wish to cover it, frustrating the professor and robbing the student with good grades of vital information. The morale of the class is put in jeopardy, leading to a further reduction in the amount of material that can be offered and absorbed.

#### *Lesson Learned*

**With a successful recruitment program, better-qualified students can be accepted, resulting in less effort by staff and faculty while producing improved quality graduates.**

### **Creation of the Del E. Webb School of Construction**

Leaders of the Arizona construction industry have had a powerful impact on the ASU construction program, first as individual leaders lobbying for such a program and then as leaders of the industry working through the aegis of the IAC. In 1990 members of the IAC introduced the Director of the ASU Construction Department to the Del E. Webb Foundation and helped to create the presentation that led to the Foundation's endowment of four million dollars. With that endowment in 1991, the Construction Department became the Del E. Webb School of Construction.

The Director of DEWSC has created a system of annually briefing the faculty on how the Webb funds are spent. Copies of the annual report to the Webb Foundation are made available to the

Dean of CEAS and the IAC. Even though the Director of DEWSC is the ASU releasing agent for the Applied Science Building Funds, he seeks authorization for amounts spent from the Applied Sciences Building fund from the donors and from the IAC; the industry raised these funds and should decide how to spend them. The Applied Building funds are under IAC approval control but released by the Director of DEWSC. It is essential that the IAC monitor the funds under the outreach program; a system of control, approval procedures, and accountability is required. The IAC Executive Committee members have to be key players.

### *Lessons Learned*

- **An outreach program has to have the capability of collecting and spending funds.**
- **A system of fund control, approval procedures, and accountability is required.**
- **Industry needs to be a full partner in the decision making.**

### **Conclusion**

The alliance between the IAC and the DEWSC has been successful. The IAC has been a “major link to [the School’s] success and quality” (Adcox, 1993), attested to by the growth and improvement of the School in recruitment and retention; the quality of incoming and, therefore, graduating students; an expanded curriculum; the establishment of the master’s degree program; and the increase in research and funding for equipment. The strength of the alliance is attested to, too, by the growth of the IAC. From a mere handful of professional contractors, the Council has grown to 70 members representing construction firms, construction suppliers, architects, attorneys who specialize in construction law, and the DEWSC Alumni Chapter of the ASU Alumni Association. The benefits to the Council members include meeting monthly in a non-competitive forum and to having an active part in the education of future constructors. Members serve as guest lecturers in classes about their particular fields, are among the first to receive the findings of research projects, and are ensuring themselves of knowledgeable and capable employees in the future.

Addressing the Council on May 26, 1995, Dr. Peter Crouch, Dean of the College of Engineering and Applied Science, ASU, said that he hoped CEAS would duplicate the successful model that the IAC and DEWSC have created.

During the ten-year history of the development of the alliance, the CEAS has had six deans. There has been a constant need to educate each Dean, even with an engineering background, about construction and construction opportunities. The ever-changing leadership has provided a high degree of freedom in the way in which the program is run but has made it difficult to become a college team player. Under the leadership of the present dean and the advice and support of the IAC, DEWSC is moving into the engineering family of schools.

### *Lesson Learned*

**The Construction Program needs to market internally with the university decision-makers about the construction industry.**

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