

Spring 2007

STEPS

a publication of the AGC Education Foundation



The magazine for people building construction careers from the ground up!

Seattle Aquarium Gets Extreme Makeover

Sky's the Limit for Stanton Students

Pizza, Pop and Power Tools

Smart Tools for Construction Careers



AGC Education Foundation

Advertising supplement to *Northwest Construction*



On the cover

Turner Teams Lower 27.5 Ton Acrylic Window through Slot in Roof, 11/18/06. (p. 6)

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a publication of the AGC Education Foundation

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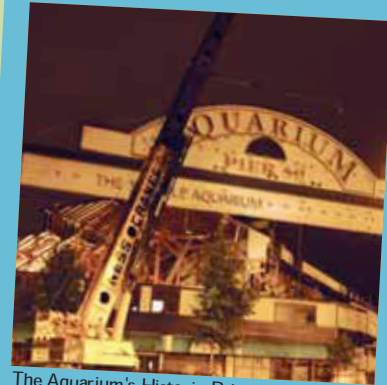
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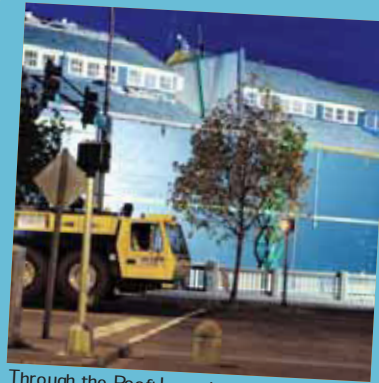
By the Numbers: Seattle Aquarium Remodel & Expansion Project

Compiled by Brooke Hintz and Cecilia Matta, AGC Education Foundation

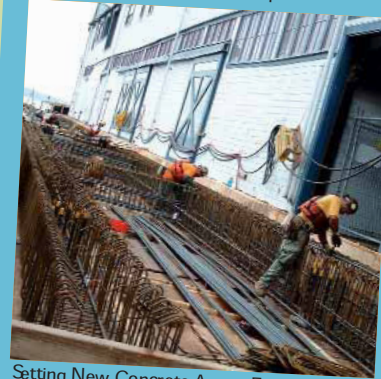
Pier 59	Home of Seattle Aquarium. City of Seattle Historic Landmark (only Pier designated as such)
1872	Origins of Pier 59 in "Seattle Coal and Transportation Co." Wharfs at base of Pike St.
1977	Seattle Aquarium opened on Pier 59
May 2005	Start of Pier Remodeling Project
September 2006	Physical completion of Remodel Phase 1 (Pier)
\$41 million	Cost of Aquarium Renovation and Expansion
70,000+ hrs	Hours of Work without a reportable safety incident on current remodel project
760	Old creosote piles removed
270	New Duplex-coated steel piles installed
18,000 sq. ft.	Current Aquarium Expansion Project
17' x 39'	Dimensions of the viewing window for the "Window on Washington Waters" exhibit
55,000 lbs.	Weight of the viewing window for the Window on Washington Waters exhibit
120,000 gal.	Volume of showcase tank for the Window on Washington Waters (WoWW) exhibit
30.5 hours	Time span of monolithic concrete wall continuous pour for WoWW tank (10/1/06)
24	# of carpenters, laborers, iron workers, electricians and Turner project staff on WoWW concrete wall pour
4.5	Turner Construction Project Staff - Pier Remodel Phase 1
3.5	Turner Construction Project Staff - Exhibits Remodel Phase
42	# of Contracts with Subs & Suppliers
70	Peak # of workers on-site for Phase 1
25-30	Avg # workers on-site for Phase 2
3:00 pm	Octopus feeding time
1	Baby Sea Otter conceived and born during renovation
June 22, 2007	Planned Opening of Aquarium Expansion



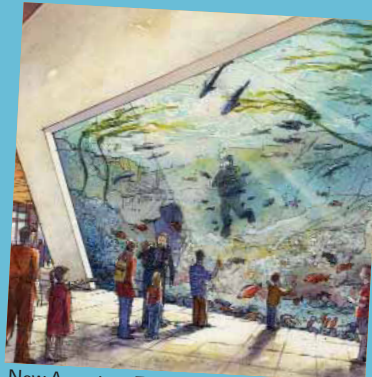
The Aquarium's Historic Building Façade Removed For A Facelift



Through the Roof: Lowering the 55,000lb. WoWW acrylic window into place



Setting New Concrete Apron Forms for Aquarium/Pier 59



New Aquarium Exhibit, "Window on Washington Waters", Rendering courtesy of Stephanie Bower.

Seattle Aquarium: Turner Construction Manages Extreme Makeover for Sea Creatures

By Cecilia Matta, AGC Education Foundation

The Seattle Aquarium, located on Pier 59 on the waterfront, will complete a \$41 million remodeling and expansion project this June, when it unveils dramatic new exhibits and visitor facilities, built over the water on a reconstructed pier. As both an educational institution and a waterfront tourist attraction, the improvements will advance the Aquarium's vital mission - inspiring conservation of our marine environment. During the past fall and winter, STEPS conducted behind-the-scenes visits and interviews with **Turner Construction's** project crew, to bring you a preview of this challenging, high-profile project, and the smart construction people making it happen.

The roots of the Aquarium's current construction project began in 2003, when the Seattle Parks Dept. hired Howard Burton's structural engineering firm, Seattle Structural, to check out the structural integrity of Piers 59 and 60, where the Aquarium sits, as they considered expansion plans. When they discovered dangerously rotted pilings and structural weakness, Seattle Structural's evaluation offered two choices, either invest in a major structural upgrade and remodel, or build a new facility elsewhere.

Following the decision to keep the Aquarium on Pier 59, the Parks Dept. then engaged Seattle Structural as the prime consultant to layout plans for a new underwater foundation and to devise a new shell and core to accommodate the Seattle Aquarium Society's new vision for their home. Burton, the firm's President, credits all the parties involved for "sitting down in the same sand box to make it happen. Everybody - the City Council, the Mayor, Seattle Parks and Recreation, Seattle City Light, the multiple design teams, Turner Construction, their subs and the trades - all recognized the economic value and caché of the Aquarium project and gave superb cooperation."



Laying out Rebar for Pier 59 Concrete Apron



Carpenters Work on Aquarium Façade and Entry



Pouring Concrete for Pier 59 Apron

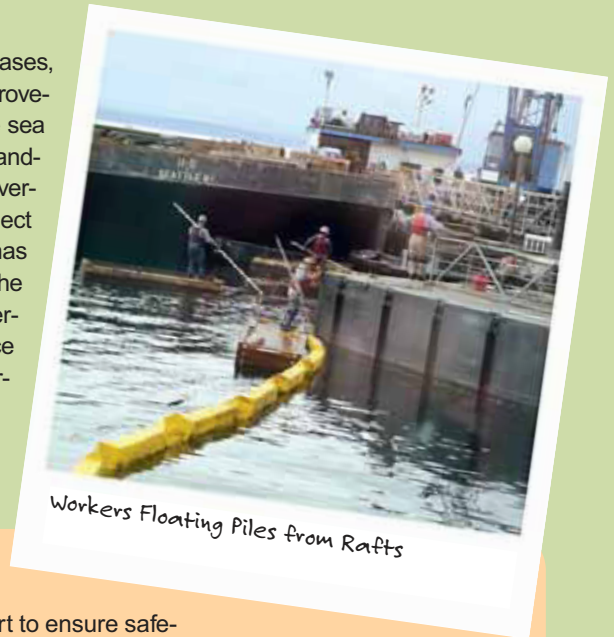


Seattle Aquarium Has Remained Open during Most of the Remodel Project

Aquarium Extreme Makeover continued...

Turner has managed the highly specialized Aquarium project in two phases, through their Special Projects Division. Renovations and tenant improvements are tricky when the tenants remain in residence. When you have sea creatures, scientists, staff and visitors as tenants, in a treasured Seattle landmark, on the edge of a fragile marine ecosystem, the logistics can be overwhelming. According to Craig Vierling, Turner Construction's Project Manager on the initial, structural renovation phase, "Our top priority has been keeping everyone safe (both the public and onsite workers), the Aquarium open, and the animals happy!" Turner Construction, the general contractor, grappled with issues ranging from the historical significance of the pier façade to tides, which Vierling stressed "required a huge prioritization of tasks!"

The Turner team faced these extreme challenges to stay safe, on schedule and on budget:



Workers Floating Piles from Rafts

Safety: From policing fall protection and enforcing personal protective equipment (including life jackets), to careful planning required below the deck, it took a team effort to ensure safety in all work areas. Below the deck of the pier, workers replacing pile and installing new utilities had to plan their work around the tides, and be on the lookout for waves and swells created by ferries and other passing boats, as they worked from floating rafts or off scaffolds attached to the under-pier pilings. Working on the seabed with chainsaws required intense awareness of their surroundings by divers, only one of whom worked in the water at a time, due to visibility challenges. Turner and the onsite subcontractors and individual trades' people achieved a major feat with over 70,000 working hours with no reportable accidents.

Logistics & Sequencing:

Large pieces of equipment (barge cranes) + large structural elements (pouring a 120,000 gal. tank) + underwater work (replacing 760 piles.) Communicating with multiple owners and meeting their needs, which included keeping the Aquarium open.

Ecological & Environmental:

Abiding by the Endangered Species Act, construction crews only had a "fish window" between August and January when they could work on pile removal and pile driving underwater. During salmon spawning and migration, February through July, they could not work below the water, only in the splash zone.

Historic:

With the Aquarium's designation as a Seattle Landmark, shoring up the pier and expanding the facility without altering the exterior appearance of the Aquarium building added a significant degree of difficulty.

Unique Tenant Improvements:

Installation of a 120,000 gallon, 17 ft. high X 39 ft. wide "Window on Washington Waters" viewing tank; a 27.5 ton acrylic window and a 40 ft. X 8 ft. X 6 ft. tall wave tank.

Weather Dependency & Tides:

Tides and roller waves from the ferries affected the floating work platform, with 8 foot to 12 foot variations each day. Workers often worked at night and on weekends, to take advantage of favorable tides, to have room to work safely under the pier.

Aquarium Extreme Makeover continued...

Phase One: Shell & Core Structural Renovation

From June 2005 through early September 2006, Turner carpenters and concrete experts, along with subcontractor iron workers, roofers, divers and pile bucks, completed a massive makeover of the Pier. During the peak of construction, 50 workers toiled on site on these tasks:

- ▶ Demolished the east end of the original pier structure down to the seabed.
- ▶ Demolished the wooden apron/walkway surrounding the pier and built a new concrete and steel pile-supported apron, which also stabilized the existing pier barn structure housing the current marine exhibits.
- ▶ Replaced the rotted 760 wooden pilings underneath the pier with 270 coated steel piles
- ▶ Relocated the pump house that provides the sea water for the Aquarium's fish and mammals;
- ▶ Provided a raised access floor on the new east end slab, to run the piping and wiring for the building's complex mechanical systems underneath it.

Turner had 42 contracts with suppliers and subs, including the marine work performed by ACC Hurlen, who removed and rebuilt the aprons, built the new east end deck and removed and replaced the under-pier pilings, as well as cleaned up the seabed. Vierling shared that the most unusual contract involved furnishing a shark cage for the Aquarium's divers, who film and study the predatory Sixgill sharks that hang out below the end of the pier. "When was the last time we had to buy one of those?" he added wryly.

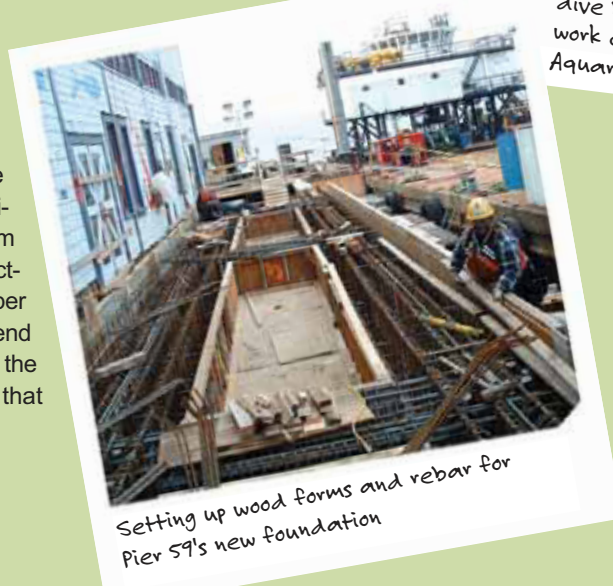
Turner "self-performed" the interior elevated concrete slabs, the apron topping slabs and the vertical concrete work on the elevator shaft, through their own Turner Concrete division. These experts focused on the details of these very specialized jobs, to have more control and to manage the risk better. Turner Carpentry, another self-performing division that acts as a subcontractor on the job, completed the finish carpentry for all exterior siding and the interior trim and doors. Wood-lam Structures erected the heavy timber frame of the rebuilt east end and removed and replaced the historic building facade that faces Alaskan Way.



Turner's teams replaced 760 rotted wood "toothpick" piles with 270 Duplex-coated steel piles on Pier 59



Driving temporary "spud" piles for a dive barge from which divers will work on replacement piles under the Aquarium building"



Setting up wood forms and rebar for Pier 59's new foundation

Aquarium Constructors: Extreme Team Combine Skills + Smarts

By Cecilia Matta, AGC Education Foundation



Pile buck talks to crane operator during removal of old piling.

How many construction people does it take to remodel the waterfront home and interactive museum for fishes, sea mammals and the scientists who study them? At the Seattle Aquarium, where a major renovation and expansion has been underway since June 2005, over 120 team members, including structural engineers, carpenters, architects, plumbers, fitters, project managers, pile bucks, electricians, glaziers, roofers, divers, illustrators, photographers and others, have brought their formidable skills to this popular, "feel-good" project. STEPS wanted you to meet some of them, to understand that "construction" includes so many different jobs, one or more of which may interest you.

These successful constructors possess a wide variety of skills, education and experience. Some, like Craig Vierling and Doug Sharp, knew they wanted to build things even in grade school; while others, like Tricia Stovall, "never expected I would be here today!" Read more about them, and consider how you might combine **your skills** with what **you like to do**, to build your smart construction career!

Profiles begin on following pages.

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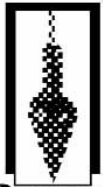
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#1
profile

Tricia Stovall



Job Title/Company: Project Manager, Turner Construction (14.5 Yrs.), Seattle Aquarium Project Phase 2, Exhibits & Tenant Improvements.

Education: B.S. Construction Management, Washington State University, 1997. Used tuition-assistance benefit from Turner to attend community college at night for 5 years. Later she left Turner briefly to attend WSU full-time, to earn her bachelor's degree.

First Construction Job: Started at Turner at age 19 as a temp, doing admin clerk & receptionist tasks. "Did not have a clue about construction when I started," but got hired on full-time after 2 days, and moved on to purchasing and estimating. Came straight back to Turner after finishing at WSU, to work on a UW (hard for a Cougar!) Oceanography building.

On Women in Construction: Tricia has pushed hard "to gain field experience with the guys. There are a lot of women now in construction, and Turner has been proactive for women, and general contractors have gotten more open, especially with more women owners, architects, engineers and inspectors. Visit a jobsite. Ask questions. Be curious."

Career Advice: "You have to figure out problems in a team atmosphere and relay the info to the field. It's not just math and details. It's communication, person-to-person, on a job level, and up and down the ladder, through the ranks of your team."

Choosing a Construction Path: "Look at things that look interesting. There are 40 different trades in construction, lots of specialists like painters, cement masons, electricians. Many behind-the-scenes people are instrumental in how the job is designed, planned, scheduled, financed and built. You could be one of them!"

#2
profile

Doug Sharp



Job Title/Company: Project Architect, Mithun (5 Yrs.), Seattle Aquarium Exhibits and Tenant Improvements.

Education: BA, Architecture, Pratt Institute, Brooklyn, NY, 1990.

Early Career Thoughts: Always had the ability to use his hands, to draw and build things. First building he admired – TWA Terminal at JFK Airport, designed by Eero Saarinen, so Doug went to JFK often to study this building. He "wanted to be part of great teams of people designing and building structures like this."

What He Studied: In high school, Doug took art drawing classes and architectural/mechanical drawing, which in the 1980's "pre-computer" world, meant hand drafting.

Why Architecture? "Strikes a balance between art and science, connected to many facets of nature and science, biology and natural systems."

Life Advice: "Have multiple and varied interests as a person. Find fulfillment and explore it further."

Career Advice: "You have to be competent with computers. Set yourself up for a lifetime of learning. What you learn in high school is a base. All that you learn will change. All jobs require education + intelligence + openness + enthusiasm + patience!"

Aquarium Thoughts: "Very complex, multiple tasks at once, with unusual construction over water. The Aquarium is adjusting its identity as a real science institution. As designers, we've used visual clues to project a clean and sophisticated image, to make it fun, but not cartoony." "Can't wait to go there with my kids (ages 4 yrs. and 2 yrs.) who love the Aquarium."

#3
profile

Larry Barton



Job Title/Company: Senior Project Superintendent, Turner Construction (7 Yrs.), Seattle Aquarium Phase 2, Exhibits and Tenants Improvements.

Construction Career Path: "Have built a lot of interesting things." Progressed from his first job, at 14 yrs. old, scraping concrete form panels at a new Safeway store, to working in house construction, doing basic jobs like cleaning, sweeping, hauling. Later, he passed the union test to earn his Journeyman carpenter card. Worked his way up to foreman, then Acting Superintendent, now works as a Senior Superintendent.

Early Career Thoughts: "Worked as a Pan Am aircraft mechanic after getting out of the military. Pay was \$4.00/hour. When I learned that the union laborers were making \$7.00/hour, a light went on."

Most Challenging Part of His Job: "Keeping the site upbeat and the people excited about coming to work. You have to keep people enjoying what they do, to get a lot more out of them."

Most Important Skill for His Job: His ability to find qualified people to do what needs to be done – finding the right people for the position. He likes to build relationships – as one of the steps to create a better building.

Thoughts on Construction Careers: "You can't drop-out and work construction. If so, we don't want you and can't use you. We pay quality wages for quality work. All jobs need good laborers who know where everything and everybody is, what's safe and what's not, and what to do about it! All foremen have computers, so you need computer literacy and the ability to read drawings. We need talented, educated people! We're every bit as professional as any college grad."

Advice for Youth: "Learn how to work and make progress; plan and organize to reach and attain your goals. No matter who you are, you still need to take the steps to get the job done, whether you're sweeping up or running the job. People aren't owed anything except an equal chance."

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#4
profile

Tim Quinn

Job Title/Company: "Pile Buck" - Carpenter/Pile Driver/Foreman, ACC Hurlen Co. (11 Yrs.), Seattle Aquarium, Phase 1, Structural Renovation



First Thing He Built: "Hydroplanes to take to the local swimming hole as a kid."

What/Who are Pile Bucks? "A specialty trade of carpenters who work on bridges, docks and foundations. We do about 1/3 pile driving, 1/3 welding and 1/3 concrete work."

Hardest Part of Job: "On the Aquarium, we had the challenges of an accelerated remodel project, in the middle of winter, through a long streak (23 days) of rain. It's hard to stay warm and dry. You change your raingear more than once a day and drink lots of coffee!"

Best Part of Job: "Working outdoors on a sunny day. Getting plenty of exercise without having to go to the gym!"

Cool parts of Aquarium Job: "Proud to take part in a good civic project! Enjoyed working with Turner and the Seattle Parks Dept. Proud of our safety record. We had a big crew - 40 at the peak of work. We floated in the new steel piles, installed them underneath the pier, with all access from the water and barges. For the concrete work, we had long slick lines - up to 600 ft."

Becoming a Pile Buck: "Have to apply and go through full apprenticeship, unless someone hires you in at the journeyman level." Apprentices take a cycle of classes, alternating with on-the-job-training. Local 2396, United Brotherhood of Carpenters www.pdl2396.org

Continuing Education: STP (Supervisory Training Program) at AGC Education Foundation; STAR Training at ACC Hurlen (Supervisory + Safety); OSHA 10; HazMat (Hazardous Materials) training.

Career Advice: "You have to have the desire. We need more people opting for construction careers. We do smart, essential work, and the pay is good - some make as much as attorneys!"

#5
profile

Craig Vierling



Job Title/ Company: Project Manager, Turner Construction (15 yrs.), Seattle Aquarium, Phase 1, Structural Renovation

First Construction Projects: Built tree houses. Loved building things. "In high school, always made sure I got two periods of shop class back to back." He had various construction jobs in high school and college then started a remodeling and painting company of his own; this later morphed into an exterior remodeling business, which he operated with 3 friends.

Early Career Ideas: Thought about engineering and dentistry, but really wanted to build buildings. After starting out at the UW in Engineering, heard about the "BCON" (Building Construction) program in the UW's School of Architecture. "I had all the engineering classes, so had to bone up on construction management classes. Once I was in the program, I knew that's what I wanted!"

Education: B.S., Construction Management, University of Washington, 1986.

Thoughts on Construction Management: "For me, the path of academic preparation + field experience + knowing how to build things has been critical; it's given me the confidence to talk with the guys about all aspects of the job. You can ask the hard questions, make things run smoother. The broad knowledge base of our team has made this project more successful."

Construction Career Advice: Throughout construction, you'll find good living wages at all levels. Laborers come right in at scale at entry level. For many jobs, you need a higher level of computer skills, especially engineers. The crossover from the field to the management side often comes from carpenters – the builders. What do you want to do? It takes ambition + aptitude + skills!"

#6
profile

James Luster

Job Title/Company: Carpenter Foreman, Turner Construction (7 Yrs.), Seattle Aquarium, Phase 1, Structural Renovation.



Why Carpentry? "I was a captive audience in 6th period, high school wood shop class. I like the process of seeing things come together."

Education: Carpentry apprenticeship (4 yrs.); Blueprint reading, First Aid & CPR; Foreman's training.

On Construction Education: "The schools need more alternative classes. Wood shop, metal shop and auto mechanics are gone. For career counseling, we need to put a spotlight on vocational education, not just have all the focus on going to college. Don't look down on these trades!" James has worked with Seattle Vocational Institute and South Lake Alternative High School, to promote construction careers.

Cooler part of Aquarium job: "Keeping a safe work site is a big part of my job, from fences to protective gear to monitoring safety practices. We had a good safety record. Replacing the piles and keeping the Aquarium open through all the construction – that was quite a big accomplishment."

Career Advice from a Smart Carpenter:

"There's always someone who needs something done by a carpenter. You get paid every week. It's a good field that creates other options for you. Carpenters work from the foundation to the roof, from lay out and framing to dry wall, doors and finish work. Once you learn this skill, you can go anywhere."

#7
profile

Howard Burton



Job Title/Company: President, Seattle Structural, Consulting Structural Engineer on Seattle Aquarium remodel and expansion.

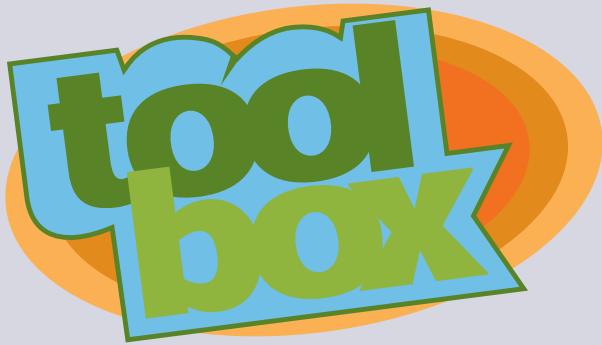
Education: MS, Structural Engineering, University Washington; BS, Civil Engineering, Rice University.

Construction Foundations: Grew up in Lewis County, headed to Rice University to study chemistry, dropped out and worked construction for 7 years, owned and operated a construction company. Went back to Rice University and finished degree in Civil Engineering. After getting his M.S. degree at UW, Burton worked for the Structural Engineering firm of Skilling Ward Magnusson Barkshire Inc (Now MKA) from 1987 to 2002. He started up Seattle Structural in 2002.

On Career Paths: "For project managers, the rank and file usually comes from a construction management program, or civil engineering. There are processors and builders in construction. Decide which you are - project management (process) or can you build? The best people have their feet on both sides."

Construction Wisdom: "The overriding challenge on any project is to get along and make it happen. You're often putting massive pieces of things in place. You have big budgets and big risks (physical, financial, mental). To get it all done successfully, without death or injury, bankruptcy or bad press is quite a feat."

On the Aquarium Project: "There are many points of departure (on a project). What is fair, what is the right course? All cylinders clicked on this Aquarium project. It doesn't always happen that way."



By Cecilia Matta, AGC Education Foundation

Education: Vital Tool for Smart Construction Career Seekers

Building success in our smart construction industry demands strong education credentials, just as in other fields. In the “good old days,” construction career seekers usually learned on the job, often in a family business or by following an apprentice path in the trades. Technology and the complexity of managing the design, build and business layers of projects now demand more formal construction education, in addition to on-the-job-training. Whether considering a career path as an accountant or bricklayer, carpenter or engineer, education ranks as the primary tool you will use to build your career.

Recognizing this need for industry-specific education as they built and ran their own companies, several visionary leaders of AGC (Associated General Contractors of Washington) created the **AGC Education Foundation** in 1980. These leaders, including Don Bocek, Allan Osberg, Larry Johnson, Frank Young Jr., Jim Crutcher and Bob Landau, invested their own funds, and solicited others to join them, to create scholarships and grants to fund smart people and programs in construction education. They have realized an excellent return on their savvy investment, as new waves of our “scholars” take on leadership roles in our industry.

Since 1980, our **AGC Education Foundation** has awarded over 200 scholarships to students pursuing 2 year and 4 year construction-related degrees. In twenty six years, many of those scholars have moved into partner and principal positions, some have started their own companies, and all have ably managed complex projects that we see all around our thriving Northwest.

STEPS caught up with several of these new construction leaders recently, to gain their insights on life in the construction industry. Get inspired for your own construction career path – read on!

Visit our website for more information on our Foundation scholarships and grants, www.constructionfoundation.org. Also see: Construction Education Scholarship Resource list, p. 25.

Scholar: Brad Hayes



School/Degree/Year: University of Washington, Construction Management, 1988
Company: Sellen Construction
Job title: Sr. Vice President/Sr. Project Manager

Years in Construction Field: 21

Current Project: Bill and Melinda Gates Foundation New Seattle Campus Project

Challenges on the Job: Everyday has a new challenge – that’s what makes our job interesting. The challenge is also one of the things I like about coming to work each day.

Satisfaction on the Job: I love the fact that when we complete a project, you can see the physical building or project that we helped create. I really enjoy helping people achieve their goal of getting a new building or a new work environment.

Continuing Education Since College: I’m a true believer in continuing education. I’ve taken more classes than I can list. There are always new things to learn and refresher classes to take!

Advice for Construction Career Seekers: This industry provides a great career opportunity with many challenges and a huge amount of satisfaction.

Favorite Tool: My cordless drill.

Scholar: Allison Worrell



School/Degree/Year: Central Washing Univ., Construction Management + Business, 2003

Company: Sellen Construction

Job title: Project Engineer

Years in Construction Field: 3

Current Project: Estimator at Sellen Main Office

Challenges on the Job: Time Management! Regardless of your project or role in the construction field, you will be pulled in 10 different directions by 10 different people. You have to learn how to set deadlines, be efficient and delegate.

Satisfaction on the Job: There is nothing more satisfying than completing a job on-time and surpassing your clients’ expectations.

Continuing Education Since College: AutoCAD, Communication, Timberline.

Advice for Construction Career Seekers: Communicate, communicate, communicate! Construction really is a people-business, and you will excel if you utilize good people skills.

Favorite Tool: Sliding compound miter saw

Scholar: Jennifer Creighton



School/Degree/Year: University of Washington, Construction Management, 1999

Company: McKinstry Co.

Job title: Project Analyst

Years in Construction Field: 7

Current Project: Microsoft West Campus. Last Project - Massachusetts Institute of Technology Brain and Cognitive Research Facility in Boston.

Challenges on the Job: In the red hot Seattle construction market, it has been a challenge to hire staff for all the new projects. Everyone is doing more with fewer resources. There is a lot of opportunity for new construction graduates to make a big impact when they start working full time.

Satisfaction on the Job: Helping clients fulfill their vision for a project.

Continuing Education Since College: LEED Certification (Leadership in Energy and Environmental Design)

Advice for Construction Career Seekers: Look for the company that is the best fit for you.

Favorite Tool: Hammer