
Cover Story

Cira Centre Named Delaware Valley's 2006 Outstanding Engineering Achievement

It is safe to say that the skyline of Philadelphia will never be the same. Completed in November 2005, the visionary design and striking location of Philadelphia's newest skyscraper has already made the Cira Centre a landmark for the City. As the first new office tower completed in area in almost 15 years, the Cira Centre represents the future of the City of Philadelphia and a revival for several surrounding sections of the City.

Pennoni Associates Inc., working for client Brandywine Realty Trust, provided site/civil engineering, survey, environmental, geotechnical, and construction inspection services for the design of the Cira Centre. While building a structure the size of Cira on any site would pose challenges, the site chosen for Cira was especially challenging for a number of reasons. Pennoni's innovative and forward-thinking engineering work enabled the

design and construction of Cira to become a reality, and led to the Cira Centre's selection as the 2006 Outstanding Engineering Achievement award by the Delaware Valley Engineers' Week Council.

World-renowned architects Cesar Pelli & Associates (now known as Pelli Clarke Pelli Architects) were the Design Architects for the Cira Centre, and created a building like no other the City has seen. Cira expands downtown Philadelphia across the Schuylkill River into a new region occupied by 30th Street Station, the University of Pennsylvania, and Drexel University, linking business to the research, education, and culture offered by these two fine universities. Located at 2929 Arch Street, Cira was constructed in a portion of Amtrak's North Parking Deck within the former Amtrak Rail yard. It is directly connected to 30th Street Station via a pedestrian bridge across Arch Street through the upper level, and is



adjacent to the new Amtrak parking facility. While this site made the building accessible from all modes of transportation, including rail, car, subway, trolley, bus, and taxi, it presented significant civil engineering challenges.

The Amtrak Rail yard site was the proposed site for several large building projects over the last 40 years. In the late 1960s, it was looked at and ruled out as a potential site for Veteran's Stadium, and in the 1980s it was proposed as a location for the Pennsylvania Convention Center. While both of these large facilities were eventually built on other sites, close examination began of the air rights above the tracks to determine the potential for future development. In 2002, when Brandywine was awarded the development rights for the parcel north of the station, Pennoni began the huge



undertaking of designing a site plan to accommodate a major office building on this long-neglected site.

Looking at the site from street level can be deceiving: the site may look routine, but in actuality it is not. Arch Street is located on an elevated deck about 20 feet above the Amtrak Rail Yard. The yard is filled with trains coming and going from 30th Street Station. These lines provide enough electricity for the trains, but were of little use in powering a 29-story skyscraper. In addition, the rail yard did not have adequate utility infrastructure for telecommunications, water, or sewer. On a normal City site, those necessary utilities could be pulled from public services within the street, but Arch Street did not contain the necessary utility infrastructure. Pennoni discovered that sufficient utilities were located on Market Street, about 900 feet away from the site.

Pennoni devised several possible alternatives to get utilities to the site. The goal was to provide the site with the most reliable services possible while maintaining cost effectiveness. Pennoni decided that bringing utilities from several different locations would provide the most dependable services, with a large percentage of the necessary utilities coming through the existing infrastructure running beneath

30th Street Station. Pennoni reused this old infrastructure and designed a concept for primary services that ran domestic water, fire, sewer, electric, and telecommunications through these tunnels, bringing them 900 feet from Market Street to the site.

In order to bring Brandywine's concept of a top-of-the-line, cutting-edge space to life, Pennoni needed to provide the site with redundant utility services. To do so, limited secondary utilities were drawn from Amtrak's existing usable facilities.

Successfully bringing utilities to the site was accomplished in spite of several other engineering challenges that the selected property posed. These challenges included very limited construction and loading access due to the positioning of the site between active rails, a newly constructed parking garage, and a highly trafficked city street, as well as configuring the necessary relocated utilities within the limited amount of bordering space surrounding the footprint of the proposed building.

When looking at the Cira Centre's bold and dramatic architectural design, it is easy to forget about all of the engineering work required to bring such a building to fruition. The work performed on the Cira Centre clearly demonstrates the importance of engineering in shaping the future of today's

society. While all aspects of the selected site were appealing to the client, the location created a utility nightmare for the Civil Engineer. By stepping away from the problem and looking at the project as a complete system with the surrounding area, Pennoni was able to solve the challenge and enable the project to move forward at the preferred site. Without the adaptive reuse application for some of the existing rail yard infrastructure designed by Pennoni Associates, the Cira Centre would not have been possible.

Thanks to the talents and diligence of the project team, the Philadelphia skyline has been redefined. Brandywine has taken a once unproductive site and turned it into an investment that will pay dividends long into the city's future. The design and construction of Cira also marks a return to the growth of business in the City, as most of the multi-story construction taking place in the city over the last few years has been for residential projects.

The potential for office space that is easily accessible from anywhere in the northeastern United States will help to draw people from outside the city, increasing revenues for the Delaware Valley. Cira is a landmark that all who live and work here can be proud of. ■

Cira Centre Contributors



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Giving Berth in Philadelphia

A Complex Structural Engineering Project Serves the U.S. Navy

Andrew Cushman

With more than 17 years experience as an engineer, Ahmad Nadeem, PE, has worked on many successful, innovative, and exciting projects. But the award-winning Design of a Layberth for LMSR Vessels at the Tioga Marine Terminal in Philadelphia ranks near the top of his most satisfying.

“From assisting the United States Navy, the extensive efforts of our design team, the considerable time constraints, and the ability to impact the surrounding communities and accompanying economy, this was a remarkable project,” Nadeem said.

Nadeem led a team from Philadelphia-based Urban Engineers (Urban) that supplied design and technical assistance to the Philadelphia Regional Port Authority (PRPA) to provide the U.S. Navy’s Military Sealift Command with docking space, water, steam, power, and related services for specialty ships. These ships, known as Large Medium Speed Roll-On/Roll-Off (LMSR), are part of the nation’s “Ready Reserve Fleet” that deploy U.S. ground

forces overseas in the event of war. Measuring 950 feet long, 106 feet wide, and 90 feet high, the vessels provide lift capacity for equipment to support U.S. military units throughout the world. What resulted was an innovative layberth design that was honored with the “Excellence in Structural Engineering Award” by the Delaware Valley Association of Structural Engineers. The design provided a berth to moor two LMSR vessels in a nested configuration (beam to beam).

The challenges and subsequent solutions, which generated more than \$1.4 million in savings, included designing landside bollard foundations as shallow foundations; installing multiple mooring bollards on each dolphin; and encasing the HP piles in thin-walled steel pipes and filling the space with cement grout to provide long-term protection against corrosion.

“A key accomplishment for this project was that it was turned around in five weeks,” said Nadeem, who manages Urban’s Marine

Engineering Services Practice. “It was a crazy five weeks. We were here all day and many nights. We also helped expedite the process by assisting the PRPA in procuring the construction materials while we were designing.”

Innovative solutions developed by the design team included:

The landside bollard foundations were designed as shallow foundations. This is a bold deviation from the region’s marine engineering community’s belief that port structures should be designed using pile foundations. In association with Geosystems, Inc. (geotechnical consultants), it was determined that using piles was unnecessary for the foundations due to the favorable soil characteristics at this site. This decision saved approximately \$800,000.

Due to the need for several mooring dolphins, the original conceptual plans for this layberth called for four mooring dolphins and two breasting dolphins. Urban proposed



Overall View of the Berth with LMSRs Moored



Falsework for the Breasting Dolphin Pile Installation



Aerial View of the Berth after Project Completion



Side View of Breasting Dolphin

installing multiple mooring bollards on each dolphin, resulting in the need for only two mooring dolphins and one breasting dolphin. Depending upon the location of the mooring dolphins, installation of multiple bollards imposes eccentric loads on the dolphin structure. However, the additional cost to design and strengthen the dolphins for these eccentric loads was significantly less than constructing another dolphin. It is estimated that this decision saved \$700,000.

The Navy required that the installed bollards be tested prior to its acceptance of the berth. An economical method was developed by Urban to test the newly installed bollards to 100 tons. The testing of bollards had not been performed in this region in the recent past. A more expensive method of pulling the bollard using a tugboat has been used in other parts of the country.

HP piles were used as the foundation elements for the offshore structures at this berth. Due to the larger exposed surface area, HP piles are subject to erosion and corrosion in a relatively short span of time while the pipe piles perform satisfactorily. Coating HP piles with coal tar epoxy does

not provide a long-term solution. The uncoated HP piles on this project were encased in thin-walled steel pipes and the space between the HP piles and the pipe was filled with cement grout. This solution provided a long-term protection against corrosion and provided additional structural strength to the HP piles.

“Corrosion of piles is a big problem and is an expensive proposition over time,” Nadeem said. “We installed thin pipes over the pile – like a sleeve – and then filled the space between the two with cement grout so there is no space for water to get in and corrode.”

Nothing could tarnish the potential impact the project will have on the surrounding area. In its heyday, the Philadelphia region was a critical element in the nation’s military framework. Of all the military connections that the region had, the naval connection stood out from the time that the Philadelphia Naval Shipyard was established in 1801 as the first naval shipyard in the United States. The Shipyard was closed in 1995. The LMSR project and the recent announcement declaring Philadelphia as a

“Strategic Port” is a strong indication of the U.S. Navy’s renewed interest in the Philadelphia region.

Among the benefits the presence of the LMSRs will have include federal investment in the port, increased cargo volume, greater revenues for the PRPA, employment opportunities, secondary economic activity, including spending by the workers, and revitalization of activity at Tioga Marine Terminal.

“This was a major project from the Navy’s side, but it was just as important to the Philadelphia area and the surrounding communities,” Nadeem said. “Looking back on this project, it makes you feel good.” ■

Andrew Cushman is a Marketing Coordinator at Urban Engineers, Inc.

Modular Concrete Classrooms

After months of planning and design details, the New Jersey Roselle Board of Education approved a \$5.2-million contract that allowed for the construction of permanent modular concrete classroom units at Grace Wilday and Leonard V. Moore middle schools. The Roselle Board of Education committed to a plan that would result in a restructuring of the district's schools.

The plan involved constructing twenty-one permanent modular classrooms, girls and boys bathroom, storage, janitor's closet, teacher's workroom, Vice Principal's office and mechanical room (24,681 sq. ft.) at Grade Wilday Middle School, and four modular classrooms (4,350 sq. ft.) at Leonard V. Moore Middle School.

The idea behind the project was to give the middle schools more classroom space to work with, meaning smaller class sizes. School officials believe smaller classes lead to better education and better test scores for the students.

Part of the master plan is to have enough room to bring all of the district's kindergarten students back into neighborhood school buildings instead of at the two private academies they currently attend. This would mean a significant savings to the district.



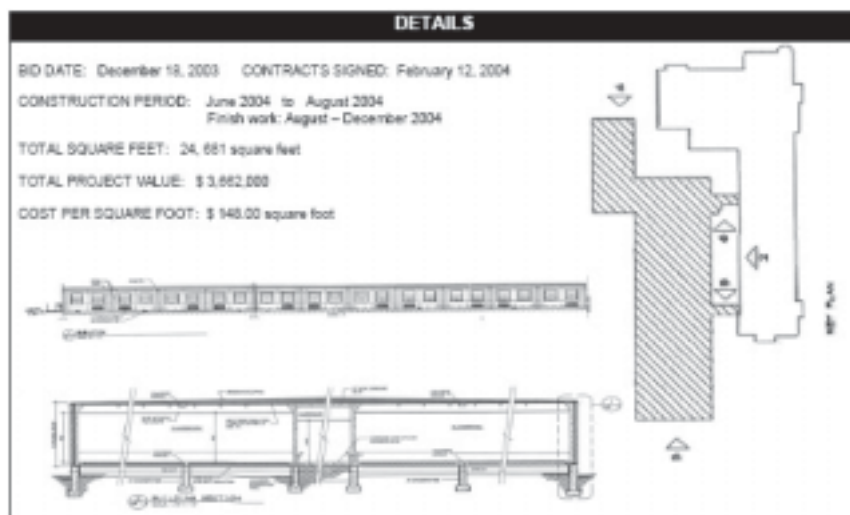
"These modular classrooms are not prttables or trailers. They are permanent structures that will provide a safe, secure, and attractive educational environment," stated Ms. Darlene M. Roberto, Superintendent of Schools.

The permanent designs consisted of fifty-eight, four-sided precast concrete building modules, precast wall panels and corridor roof slabs. Precast modules were outfitted with windows, electrical and communications conduit and exterior V-groove pattern exterior finish. Interior and exterior walls were painted prior to being shipped to the site.

With full support of the Roselle Board of Education, contracts were signed on February 12th, preliminary work on the project began in late March, with completion

of the four modular classrooms for Leonard V. Moore completed in August. At the end of August, the twenty-one classroom addition for Grace Wilday school was erected in just 9 days and turned over to the school district in December.

Oldcastle Precast Modular Group, located in Telford, PA, designed, manufactured and erected the fifty-eight concrete modules and additional precast components. SBN Enterprises of Tom River, N.J., was the general contractor, The Gibson Tarquini Group of Camden, N.J. was the architect, and H. Wilden & Associates of Allentown, PA was the precast engineer. ■



On Capitol Hill

John D. Wanner, CAE

House Tax Reform Gets Cold Reception in Senate

In December, the House passed a sweeping local tax reform plan aimed at reducing property taxes and replacing them with gambling revenues, an increase to the personal income tax and an expansion of what is taxable under the sales tax. That bill, Senate Bill 854, was the subject of a Senate hearing on January 4th. Numerous groups testified against the bill, mostly those that would be newly subjected to the expanded sales tax. Banks, investment advisors, insurance companies, non-profit organizations, advertising firms and consultants of all types dominated the hearing with descriptions of the negative economic impact of taxing the various services targeted by the bill. PSPE submitted testimony objecting to the expansion of the sales tax to include "environmental" and "technical" advice, two areas that pretty clearly would cover some branches of engineering.

In general, it is fair to say that the Senate found the House bill unacceptable. The bill does not raise enough additional revenue to offset property taxes enough to deliver on the promised tax relief. More to the point though, the Senate has quietly indicated that they are not interested in any tax SHIFTING in an election year. The Senate did pass its own version of local tax reform, Special Session Senate Bill 30, which would require a local vote in each school district to determine if that district wanted to replace some property taxes with an increase of the earned income tax. The Senate plan forces the issue down to the local level, but the House could not muster the votes to pass that bill.

For now the issue is being negotiated behind closed doors. The Senate, House

and Governor do not presently appear close to agreement on any issue other than that they do not want it drag on. A vote on an agreed to plan is expected in late January or early February provided that a compromise can be worked out. Our lobbyists are actively working to prevent any expansion of the sales tax to things like engineering services. At the same time, we continue to pursue a broader exemption for "construction" in the bill's back-end referendum provisions.

Growing List of Legislators Announce Retirements

2006 portends to be a shakeout election year. As many as 40, and perhaps even more, new House members may be elected in November, as a slew of members have already announced they will not seek re-election; others are seen as vulnerable to challenges, either in the May primary, or in November. As of this writing, members who have announced they will retire after the 2005-2006 session include: Representatives T. J. Rooney (D-Lehigh), Sheila Miller (R-Berks), Victor Lescovitz (D-Washington), Bruce Smith (R-York), Lynn Herman (R-Centre), Robert Flick (R-Chester), Kevin Blaum (D-Luzerne), Jacqueline Crahall (R-Montgomery), Ray Bunt (R-Montgomery), Tom Corrigan (D-Bucks), Elinor Taylor (R-Chester), George Hasay (R-Luzerne), John Fichter (R-Montgomery) and Larry Roberts (D-Fayette) and Senator Charles Lemmond (R-Luzerne). More are expected to announce their plans in the coming weeks, including House Professional Licensure Committee Democratic Chairman Bill Rieger, and possibly Reps. Tom Tighe and Frank Dermody. Nominating petitions can be filed from February 14 to March 7, and candidates can withdraw until March 22.

Legislative Activity

HB 1802 RE: Capital Facilities Debt Enabling Act (by Rep. Brett Feese, et al)

Amends the Capital Facilities Debt Enabling Act by adding that the capital budget bill does not need to specifically itemize projects if the itemization is contained in or approved by prior legislation referred to in the capital budget bill or included in one or more supplemental capital budget bills. Additionally, the maximum amount of redevelopment assistance capital projects undertaken by the Commonwealth for which obligations are outstanding may not exceed, in aggregate, \$2,650,000,000 (increased from \$2,150,000,000), of which \$25,000,000 may be used for the construction of housing units. The bill also adds that "redevelopment assistance capital project" may include housing units. Lastly, the Secretary of the Budget is required to provide the Chairmen of the House and Senate Appropriations Committees with a report relating to the development assistance capital projects.

House concurred in Senate amendments 12/12/2005 (170-19)

Signed by the Governor, 12/22/2005. Act No. 87 of 2005

HB 1870 RE: Minimum Bid Requirement (by Rep. David Hickernell, et al)

Amends the act entitled "An act regulating the letting of certain contracts for the erection, construction, and alteration of public buildings," increasing the minimum bid requirement to \$25,000 from \$4,000.

Removed from the table, read second time, and rereferred to House Appropriations Committee, 1/3/2006

"Capitol" continued p. 8

“Capitol” continued from p. 5

SB 736 RE: Construction Code Act Applicability (by Sen. Bob Robbins, et al)

Amends the PA Construction Code Act providing for applicability on certain uncertified buildings by adding that the department would issue a certificate of occupancy to an uncertified building if that building meets the certain requirements enumerated in the bill, unless the department deems the building to be unsafe. An “uncertified building” is an existing building which, prior to April 9, 2004, was not approved for use and occupancy by the Department of Labor and Industry or a municipality which was enforcing a building code. The term does not include a residential building.

Passed Senate, 12/7/2005 (49-0)

Passed House, 12/15/2005 (194-0)

Approved by the Governor, 12/22/2005. Act No. 95 of 2005

SB 854 RE: Health Savings Accounts Tax Exclusion (by Sen. Gibson Armstrong, et al)

Amends the Tax Reform Code further providing, in personal income tax, for medical

and health savings accounts; and repealing provisions relating to taxation of medical and health savings accounts. The bill states any amount paid out of a medical savings account or health savings account that is includable in the gross income of an account beneficiary for federal income tax purposes would be free from taxation. This was the vehicle for the Property Tax amendment.

Passed Senate, 10/24/2005 (50-0)

Passed House, amended, 12/20/2005 (103-92)

Rereferred to Senate Rules and Executive Nominations 1/3/2006

Public hearing held in Senate Special Session Legislation committee, 1/4/2006

Senate Legislation Committee meeting set for 9:25 a.m., Hearing Room #1, North Office Building, 1/18/2006

New Bills Introduced

SB 1046 RE: Swimming Pool Security (by Se. Bob Mellow, et al)

Amends the PA Construction Code Act further providing for adoption by regulations by adding that the regulations would require an owner or lessee of a residential swimming

pool, hot tub or spa to secure the structure with a barrier that has a locking device to prevent access to the structure when it is not in use; and utilize the locking device when the pool, hot tub or spa is not in use.

Referred to Senate Labor and Industry Committee, 1/3/2006

2006 House Spring Session Schedule

March	6, 7, 8 (non-voting), 13, 14, 15, 20 (non-voting)
April	3, 4, 5, 10 (non-voting), 24, 25, 26
May	1, 2, 3, 8 (non-voting), 22, 23, 24
June	5, 6, 7, 12, 13, 14, 19, 20, 21, 26, 27, 28, 29, 30

2006 Senate Spring Session Schedule

March	13, 14, 15, 20, 21, 22, 27, 28, 29
April	3, 4, 5, 17, 18, 19, 24, 25, 26
May	1, 2, 3, 22, 23, 24
June	5, 6, 7, 12, 13, 14, 19, 20, 21, 22 (non-voting), 26, 27, 28, 29, 30

Copies of all bills of interest are available from the PSPE office, or they can be accessed via the Internet at <http://www.legis.state.pa.us/WU01/LI/BI/billroom.htm>. ■

President's Message

Harry E. Garman, P.E., PLS



Although the 2005 Hurricane season ended several months ago, many communities along the Gulf Coast, from Florida to Texas,

continue their cleanup and rebuilding efforts. Those who have visited some of the communities are astounded by the extent of the damage and have difficulty as they imagine how they would deal with such a disaster.

Certainly our government is doing a lot in the rebuilding process and will spend billions of dollars in that effort. Some believe the government should be doing more while others believe it is doing too much. In any event, the more that we as private citizens and business contribute, can limit the dependency on the government.

There are a number of reputable organizations accepting contributions for the victims of the hurricanes. I encourage

everyone to continue their support in any way they can to help our fellow citizens in the affected areas. Monetary contributions are still being accepted by most Hurricane Relief Charities including the NSPE Hurricane Relief Fund. More information is available at www.nspe.org.

In September, 2005 the PSPE Board of Directors took action on the Continuing Professional Competency (CPC) issue by adopting a continuing education model for incorporation into our state registration law for Professional Engineers. At PSPE's direction, John Wanner is actively pursuing discussions with legislators in amending the registration law. It is my understanding that both the Surveyors and Geologists are on board with CPC and are interested in having their professions included in any changes in the law.

The issue of CPC has been a topic of discussion within PSPE as long as I can remember. This goes back to the late 1980's when I was first elected as a Director in the Lehigh Valley Chapter. In the past, I questioned the need for mandating continuing education because I was under

the impression that Professional Engineers would educate themselves in areas of practice as essential for them to act competently. Unfortunately, I may have been naive in my thinking. Recent events and correspondence involving Engineers and Surveyors, a few who are members of PSPE, now cause me believe that changes to the registration law may be merited. This goes against my philosophy on the role of government in that we don't need any more regulations, we simply need to enforce the laws that we have; however, I can see the difficulty in enforcing the current laws, especially the section which includes the Engineer's code of ethics.

Our code of ethics is subject to much interpretation and also includes many gray areas. A CPC requirement will define the expectations of keeping oneself educated and will be much easier to enforce when someone blatantly violates the registration law and acts unethically. This will go a long way in helping to protect the public welfare - the reason we have a registration law to begin with. ■

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Member Spotlight

**Ernest U. Gingrich, P.E., P.L.S., F.NSPE,
Named Central Pennsylvania 2006 Engineer of the Year**



The Central Pennsylvania Engineers Week Council named Ernest U. Gingrich, P.E., P.L.S., F.NSPE, 2006 Engineer of the Year. Mr. Gingrich retired from the Pennsylvania Department of Environmental Resources (DER) where he was employed for fifteen years. Prior to this he was employed by Michael Baker Jr., Inc. for fourteen years and for the U.S. Department of Agriculture, Soil Conservation Service (SCS) for seven years. He is currently employed part-time by Light-Heigel & Associates in Palmyra and SITE-Blauvelt Engineers in Lemoyne. His primary experience is in the area of dam design, construction supervision, and inspection.

Mr. Gingrich was born and raised on a farm in Juniata County fifty miles northwest of Harrisburg. He received his Bachelor of Science Degree in Agricultural Engineering from Penn State, Bachelor of Divinity Degree from Columbia International University, and a Master of Business Administration Degree from Penn State Middletown. He is a registered Professional Engineer and Professional Land Surveyor in Pennsylvania. Ernie is Immediate Past President of the Pennsylvania Society of Professional Engineers.

Mr. Gingrich and his wife, Lorene, recently celebrated their 50th wedding anniversary. They have three sons, one daughter, eight grandchildren and one step grandchild. One son is a registered Professional Engineer in Colorado.

Mr. Gingrich is a member of the Jonestown Bible Church, a member of the Board of Directors of the Greater Harrisburg Youth for Christ, and the Lower Paxton Township Planning Commission. He serves as Judge of Elections for the Township's Precinct 27, a position elected by residents of the precinct. He has served several years on the Selections Committee for the Department of General Services as appointed by the Governor.

Mr. Gingrich believes it is important for engineers to interact with each other in their respective organizations. He also believes that the engineer should take leadership roles, both in the organizations representing the engineering profession and in his/her surrounding community as the opportunity arises. Mr. Gingrich finds his experience rewarding, both in the engineering community and in the community in which he lives.

**Eric L. Flicker, P.E.,
Named as 2006 Delaware Valley Engineer of the Year**



Eric Flicker learned early that it takes more than just technical skills to develop public works projects. Eric's father served as a member of the Borough Council in Fleetwood, Berks County, Pennsylvania, and Eric watched as his father and community leaders struggled to bring public improvement projects to fruition. Watching his father work with the people of Fleetwood towards the betterment of the community made Eric committed to continue that legacy.

Eric worked over summer breaks at Spotts Engineering (now known as Spotts, Stevens and McCoy.) His job confirmed what he already knew: he had a love for engineering as well as non-technical project development, in particular project financing. At this time Eric began his long-time association with NSPE and ASCE, becoming an active member of the student chapters at Lehigh. This early experience sowed the seeds for a 40-year career of service to the engineering community.

Having engineering experience from project design to project management, from serving as a principal engineer to his current position as CFO of Pennoni Associates Inc., Eric is a true engineering "Jack of all Trades." While his involvement in the day-to-day practice of engineering has given him years of satisfaction, it is his work in promoting the profession that is his proudest accomplishment.

When accepting the state Presidency of PSPE in 1990, Eric promoted the theme of "Proud to be a P.E.," seeking to gain recognition for the profession.

Eric enjoys service that enables him to bring the values of the engineering profession to children. He served as the Founding State Coordinator for MATHCOUNTS in Pennsylvania, and has supported the event for over 20 years. He serves as the Countdown Round Moderator and plans to continue his involvement for years to come. Through his participation in the Habitat for Humanity Build a House, Build a Dream competition, Eric encourages youth to see the value and importance of the engineering profession.

Many in the engineering community have technical credentials that make them outstanding members of the profession; few have stepped beyond the technical realm and reached into their communities to represent the engineer as a leader. Eric has spent more than 40 years bringing engineering out of the office and into the community. ■

Risky Business

Part I: Some Days the Glass Just Might Be Half-empty

Rebecca A. Bowman, Esq., PE

I'm an optimist by nature. I'm a silver-lining kind of person. My glass is always half-full (or more). I look to see how I can grow in response to an adverse situation, what lesson God has in mind for me.

However, in assessing external and internal risk and in planning for loss prevention, I must set those happy attitudes aside. I must assume the worst.

In a way, competent risk assessment is a kind of succession planning. Or perhaps it is the other way around: maybe succession planning is just a kind of risk assessment. There are five components required for a competent risk assessment. First, the organization must define critical assets. Second, the organization must agree on goals, objectives, and standards. Third, the organization must achieve agreement on reasonably foreseeable hazards to those assets. Fourth, the effects of these hazards on critical assets must be evaluated. Finally, design of the assets must be adjusted to address and incorporate loss prevention strategies to assure that goals and objectives can be met in the event of a hazard.

Each of these components warrants close attention. That is why I am going to invest in a five-part series. You may want to accumulate all five parts over the course of this year.

It is all well and good to know the five components of a competent risk assessment. How do we make all that happen from a practical standpoint? In light of 9/11 and

Hurricane Katrina, much attention has been focused on Step 3, foreseeable hazards. However, it is too casual to skip Steps 1 (critical assets) and 2 (goals, objectives, and standards). That is why we are going to examine them more closely.

Have you ever played the game of Jenga®? If you are feeling a little awkward about this risk assessment process, maybe you should try a game. In Jenga®, players build a nice neat tower of rectangular blocks and then take turns removing blocks until the loser makes the tower fall down. By the middle of the game, the structure is in a precarious balance. By the end of the game, it is often difficult to guess which block will bring everything tumbling down. Try it. You will learn from it. (Plus, you will have fun with your friends and family.)

The first component of risk assessment is to identify which blocks can make your business tumble down. What are the critical assets? Equipment? Machinery? Tools? Jigs or dies? Data? Personnel? Without which pieces will the organization not function?

Do you still keep paper backups for electronic data? Can your staff function in the field if they cannot access databases at the office? Has the organization automated functions and forgotten how to perform them?

[As an aside, this is a fear I have for our future: When I was younger, everyone who

could use a computer could program, because that was the only way we could use the computer. Today, many computer users have absolutely no idea why the computer works and many have forgotten (or never knew) how to perform the now-computerized function for themselves. Without their computers, they are paralyzed. I have this fear for surveyors and engineers, too. Some surveyors and engineers are expertly facile at gathering information and inputting it into computers, but do not have the ready ability to apply thought to the output. They cannot always recognize an absurd answer.]

Consider your suppliers and subcontractors, too. Is there a component with a unique supplier that could shut you down? If you are a just-in-time operation, what happens if "it" is not just in time? Do your suppliers stockpile on your behalf? Do you have a back-up supplier?

Consider time as an asset, too. Do you have a contract with a liquidated damages clause that does not have an unforeseen site conditions clause? If you hit rock or a spring, will your project be strangled, either physically or financially?

Be thorough. You could be just as paralyzed by inoperable air conditioning as by catastrophic computer failure. Failure of your portable toilet could shut down your site as thoroughly as malfunction of a major piece of equipment.

Remember that we are beginning a five-step process. I recommend that you store this information as the first column of a spreadsheet or database. As we go along you can add new information. When we

"Risk" continued p. 18

“Risky” continued from p. 7

finish, you will have all the information compiled for action.

Now that you have completely identified your organization’s critical assets, you can move on to step 2, establishing performance and operational goals, objectives, and criteria for your critical assets. We will look at that next time. In the meantime, a relaxed afternoon contemplating your critical assets can help you prevent your business from being a Risky Business. ■

The “Risky Business” column offers articles covering liability from both the legal and engineering perspective. Mrs. Bowman’s articles share general information and should not be relied upon as professional legal advice of either a general or specific nature. Rebecca Bowman is a civil engineer-attorney in solo private practice in McMurray, Pennsylvania for more than 25 years. Her practice is a certified woman-owned business. Her B.S. in Civil Engineering is from the University of North Dakota.

Runway Project Takes Off

Dorothy Kennedy

Passengers and the general public are often surprised to hear the air traffic control tower at Philadelphia International Airport (PHL) is busier than both the New York and Washington DC area airports. But when you consider its location at the center of the busy Northeast Corridor, the designation makes sense. To give you an idea of the facilities' operational intensity, PHL accommodated a record 28.5 million passengers, including 4 million international passengers, and handled more than 486,000 aircraft takeoffs and landings in 2004. More than 604,000 tons of cargo and mail are moved annually by commercial airlines and cargo carriers. Arora Engineers, Inc., of Chadds Ford, PA is preparing preliminary and final designs for the proposed Runway 17-35 Extension Project at the busiest airport in the FAA's Eastern Region., Philadelphia International Airport (PHL).

PHL is also considered one of the most delayed airports, due partly to the airport's current configuration which includes four runways - two longer, primary ones and two shorter, secondary ones. The shorter

runways are not long enough to handle regional jets optimally. The increasing use of regional jets, which are rapidly replacing turboprop and small, narrow-body aircraft, places an unanticipated burden on the two longer runways. This lack of adequate runway surface, combined with additional factors, has resulted in increasing delays. Because the two longer runways are too close together to allow for simultaneous takeoffs and landings during periods of low visibility, these delays are exacerbated during poor weather conditions.

As engineer of record for electrical and electrical aeronautical systems, Arora Engineers is working on this challenging project with Urban Engineers, Inc., of Philadelphia. The project will increase the length of PHL's North-South runway by 1,040 feet to approximately 6,500 feet. Extending the runway by 640 feet to the north and 400 feet to the south will enhance PHL's ability to accommodate regional jets. When completed, the extension will shift more than 120 operations to Runway 17-35 and reduce congestion on the airport's

primary runways. The result will be reduced delays at PHL and, consequently, throughout the system of national airports.

Arora's design includes modifications and improvements to airfield lighting,

airport service roads and a portion of the Economy Parking Lot and State Route 291, in addition to relocating runway safety areas, connecting taxiways and navigational aids.

Arora Engineers has a 16-year history in working on projects at PHL. The firm's familiarity with the facility adds significant value on a project of this complexity, according to Manik Arora, president and CEO of Arora Engineers and project principal.

"The real challenge is the project's complex phasing," said Arora. "Route 291 will have to be vacated so we'll be working with Pennsylvania Department of Transportation on the phasing of that. And we'll be working on the extension of both ends of the runway with departure and arrival activity in progress."

To manage these challenges, engineers are tackling the project in three phases: landside development; Runway 35 surcharge; and the actual extension of the airfield, the ends of the runway and all sub-systems. Arora's scope for design includes: Low Visibility Systems, Runway Incursion Lighting, Approach Lighting, Airfield Lighting - Taxiway and Runway, Control and Monitoring, Signage, Instrument Landing Systems (NAVAIDS), Global Positioning Systems, Parking Lot Lighting, Primary and Secondary Power distribution.

Arora is confident the estimated \$40 million project will be brought in on schedule.

"Everything per the FAA's record of decision has to be commissioned and opened by the end of 2007," said Arora. "With Urban Engineers we've come up with a design to make it work." ■

