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NEWSLETTER OF THE AMERICAN SOCIETY OF
HIGHWAY ENGINEERS



Winter 2002 - 1

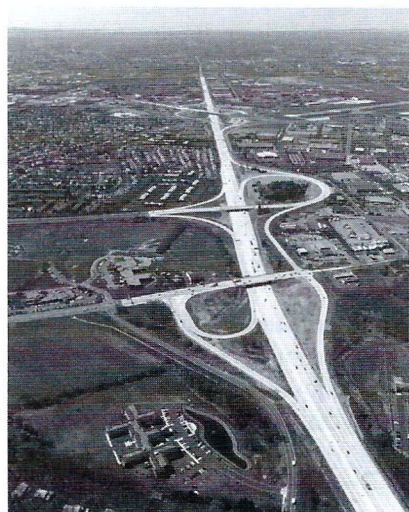
22/renew Honored as Nation's Top "Quality" Highway Project

By Matthew McTish, P.E., McTish, Kunkel & Associates

Pennsylvania's "22/renew" Expressway Improvement Project in Lehigh and Northampton Counties has earned the 2001 National Achievement Award from the National Partnership for Highway Quality (NPHQ), which recognized the project for its design, teamwork, public information campaign, and innovative construction scheduling.

Partners in the project—who share award recognition—include the Pennsylvania Department of Transportation, Designer: McTish, Kunkel & Associates in Allentown, PA, and Contractor: Lane Construction Corporation in Meriden, CT.

NPHQ includes federal and state highway officials and leaders in the highway construction industry. The National Award nomination process permits one entry from each state. In 2001, 26 states submitted a project for the award.



The \$70 million 22/renew Project restored an eight-mile section of four-lane, limited-access urban expressway, including reconstruction and rehabilitation of the original (1954) concrete pavement, replacement of three bridges, rehabilitation of ten bridges, reconstruction of five interchanges and deployment of state-of-the-art Intelligent Transportation System (ITS) components, including Ramp Metering, Variable Message Signs, and Highway Advisory Radio.

Innovative construction scheduling and traffic management strategies developed by PENNDOT District 5-0 and McTish, Kunkel & Associates greatly reduced the project's impact on the region. These strategies included maintaining four traffic lanes through the work zone during peak traffic

periods, compression of the construction schedule from three years to two years, and deployment of a "real-time" traffic control and motorist advisory system.



Through the planning and construction phases, a Citizens Advisory Committee was used to assess the needs of the local driving public and to create partnerships for sharing information with the community. Aggressive use of a public information and public involvement campaign featuring a project-specific Web site, newsletters, and more than 180,000 copies of a "22/renew Survival Guide" helped area businesses, schools, hospitals, and US 22 motorists negotiate the construction work zone. Incentive/disincentive contract provisions encouraged Lane Construction to finish 65 days ahead of the schedule for all work involving travel lane closures, earning Lane a \$5 million bonus. Lane also earned a \$107,000 bonus for producing a paved surface exceeding state and national standards for smoothness.

PENNDOT and McTish, Kunkel's Incident Management and Public Information programs for the 22/renew Project have been used as models for safe expressway reconstruction across the United States. In addition to receiving the Pennsylvania

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in Erie, PA, on June 5-9. For further
information, go to www.ASHE2002.org.



National Board News

National board members met for a regular board meeting on January 26, 2002, at the Best Western Mt. Vernon Inn in Winter Park, Florida. National President Cooper Curtis presided over the meeting. The following are highlights of the committee reports and board actions:

Membership:

There was a decrease of 31 members since the November board meeting, Secretary Conner reported. Total ASHE membership stands at 5,260, representing 34 local sections.

President's Report:

President Curtis was able to visit regular dinner meetings at the Tampa Bay and Franklin Sections.

New Sections:

Second Vice President Dave Jones presented draft copies of the ASHE promotional folder that will serve as a tool of the New Sections Committee for recruitment purposes. The folder includes background information on ASHE, a membership application, National Officers & Directors listing, advantages of membership and quotes from some of our members.

Conference Committee:

Conference 2002: Director Stuttler reported that a mailing to all sections went out in early January requesting their support for advertising in the program book. Stuttler reported an excellent industry response so far attributed to distribution of the Conference Pamphlet at last year's conference and their exhibit booth at the APC/PENNDOT Fall Seminar. Also, a mailing was made to those in the industry that had previously advertised in the Conference Program Books. Members will receive their registration packages in early March. Otherwise, all guest speakers and programs have been finalized. Visit the Conference web site linked to highwayengineers.org for more information.

Conference 2003:

Director Robert Hochevar reported that Region 1 is conducting regular committee meetings. The conference will be held at the Hilton-Akron/Fairlawn Hotel, May 28 - 31, 2003, a suburb of Akron, Ohio.

Web Site Committee:

Dave Jones reported on some major additions to the ASHE web site including posting of the "Section Operating Manual" and the "Strategic Plan" in PDF formats. The listing of National Officers will be posted soon. Also, the e-mail list generator TOPICA is now available to disseminate information and alert members of updates such as the SCANNER. The Carolina Piedmont and Old Dominion sections have been linked to the web page.

There have been no requests for industry link subscriptions to date. Initially there will be a limit of 20 links at a cost of \$200 annually. Any interested companies may contact the committee through the SCANNER Advertising Insertion Order. In the interim, the committee will be developing some criteria for approving such links.

Nominating Committee:

Immediate Past President Domenic Piccolomini announced the following slate of officers and directors for the 2002-03 ASHE year:

President	Sandra K. Ivory
1 st Vice President	David W. Jones, P.E.
2 nd Vice President	Rodney P. Pello, P.E.
Secretary	Terence D. Conner, P.E.
Treasurer	Robert E. Yeager, P.L.S.
Director - 1 Year	
Region 1	Robert A. Hochevar, P.E.
Region 2	Shirley A. Stuttler
Region 3	Frank S. Lopez, Jr.
Director - 2 Year	
Region 4	Robert M. Peda, P.E.
Region 5	Mark L. Welker
Region 6	Richard S. Prentice, P.E.
Director - 3 Year	
Region 7	Ronald L. Purvis, P.E.
Region 8	Thomas Ziegler, P.E.
Region 9	Leila Nodarse, P.E.

Operations Oversight:

Past President Charlie Flowe reported on follow-up activities of the Operations Oversight Committee, as follows:

The "Section Operating Manual" will be reviewed and expanded with regard to regional operations. Region 6 has been very successful and will serve as the general model to establish guidelines. A firm date for every region to fully fund their operations will be established after approval of the new Region Guidelines.

Forms in the "Section Operating Manual" will be revised for routing through the National Director for the Region to improve communications and eliminate multiple requests for the same services.

Responsibilities of the National Membership Committee will be modified to function as a resource to the sections. The committee will act as a clearinghouse to disseminate information on section programs, social activities, events, advertising, and technical sessions. Also, the committee will be charged with monitoring the existing sections and notifying the National Director and the National Board when a section appears to be struggling. ■

Expressway Opens on Time Despite Obstacles

By Scott A. Lovell, P.E., Senior Project Manager, Parsons Brinckerhoff Quade & Douglas

On May 23, 2001, after years of frustrating, several mile long traffic jams on Battlefield Boulevard, the long-awaited improvements to State Route 168 in Chesapeake, VA, were opened to traffic. Designed by Parsons Brinckerhoff in Norfolk, VA, the Chesapeake Expressway is a 10.1-mile long, four-lane divided highway that includes nine bridges, three interchanges, two at grade intersections, and a high-tech, eight-lane toll plaza. The project is the final link of a limited-access highway that connects Interstate 64 to the North Carolina state line. The highway allows vacationers headed for North Carolina's Outer Banks to reach their destinations without using Battlefield Boulevard, a two lane local road that was not intended to carry the heavy volumes of traffic that had been clogging it on summer weekends for years.

The grand opening ceremony, which was held on the morning of May 23, was the culmination of efforts by city officials, politicians, planners, engineers, contractors and dedicated city employees who persevered through numerous challenges to bring the project to fruition. These challenges included innovative funding, fast-track engineering, right-of-way acquisition and possibly the biggest challenge of all, the construction effort itself. Despite the intense coordination required among three construction contracts, delays caused by three hurricanes that occurred early in the construction effort, and bankruptcy of the contractor responsible for the largest portion of the project, construction was completed within the aggressive 24-month schedule. To meet this schedule, the project had to be broken into three sections. Although these sections were all part of the same construction effort, each contained uniquely different elements.

The northern section, built by Maryland-based Driggs Construction Corporation, is approximately six miles long and includes three interchanges containing eight bridges. Included



in these bridges is a curved steel flyover with a skew angle that pushed the limits of conventional bridge construction practices. All but two of the bridges in this section incorporate mechanically stabilized

earth (MSE) retaining walls into the abutments. These types of walls have not been used prevalently in the Hampton Roads region because of problems caused by the compressibility of the underlying native soils. However, using an innovative construction sequence developed by the design engineers, the abutments could be constructed at a significant savings over conventional types. The sequence involved constructing the walls with sleeves placed within the reinforced soil backfill to reserve space for piles to be driven later. By using this sequence, the MSE walls acted as a surcharge, similar to conventional abutment construction, that allowed settlement to occur prior to pile driving.

The Toll Plaza contract, completed by Chesapeake-based Mid-Eastern Builders, included construction of a 6,700 square

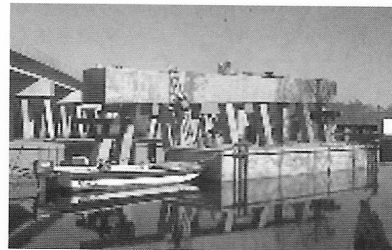
foot administration building, the toll plaza canopy and toll-booths, and 400 feet of concrete pavement. With its tall steel framework towering above the canopy roof, the toll plaza gives somewhat of a "space-age" feel to approaching motorists. This



feeling is justified by the presence of the high-tech electronic toll-collection system that allows motorists using transponders to pay their tolls without stopping. Antennas extending above each travel lane can

detect the presence of a transponder within a vehicle traveling as fast as 100 mph. Computer terminals located within each tollbooth allow administrators to keep track of the thousands of transactions occurring in each of the lanes every day. Violation Enforcement System (VES) cameras located at the end of each toll island can digitally photograph the license plates of motorists attempting to pass through the lanes without paying their toll. The miles of wire needed to connect these systems to the sophisticated computers in the administration building pass through the reinforced concrete access tunnel located beneath the roadway.

The southern section of the road, built by Norfolk-based Suburban Grading and Utilities, is approximately four miles long and included construction of a new 700-foot long bridge over the Northwest River. Construction of the bridge and approach



roadways required an impressive earth-moving operation. Organic material, up to 17 feet thick, had to be removed from the banks of the river and replaced with acceptable embankment material. As this ma-

terial was being placed and compacted, instrumentation was installed to monitor the amount of settlement experienced by the underlying native soils. The contractor was not allowed to drive piles for the new bridge abutments until the settlement had diminished to acceptable levels. The actual amount of settlement experienced was very close to the predicted amount, and the contractor was released to drive piles approximately one month sooner than expected. Once the word was given, construction of the bridge and approach roadways was completed quickly. In fact, the new bridge and approaches were the first portions of the new roadway to be opened to traffic.

The significant differences between the characters each of the three sections of the new Chesapeake Expressway made management of the construction effort a daunting task. Using their in-house construction inspection staff and construction management team, along with design consultants, Parsons Brinckerhoff, the City of Chesapeake was able to pull off the construction of this long-awaited roadway in near record time. This was despite the many obstacles that, at times, threatened to derail the project. ■

Striking a Balance Between Form and Function

What makes a bridge aesthetically pleasing? Finley McNary Engineers recently asked this question of noted bridge designers and found that many engineers believe that aesthetics are inherent in the design. The consensus is that a well-thought-out bridge can make all the difference—build it right, and it'll always look good.

Three key elements where form and function meet were identified.

Location. Visualizing where a bridge will be located and making sure it will fit where it is placed are essential. A structure can be intrinsically beautiful, but if it does not fit with its surroundings, the beauty can be lost.

Proportion. An attractive bridge is one that's properly proportioned. The size and shape of a structure's components and how they complement each other help provide a definition of its purpose. "A few feet can make a huge difference," says Miguel Rosales, AIA, president of Rosales, Gottemoeller & Associates, Inc. (Brookline, MA), a transportation architecture and engineering firm. "A bridge that's beautiful is usually very light and streamlined. To do that, you have to really work on proportion."

Simplicity. Covering up a run-of-the-mill bridge with brick or hard deck to make it more attractive almost never works. If

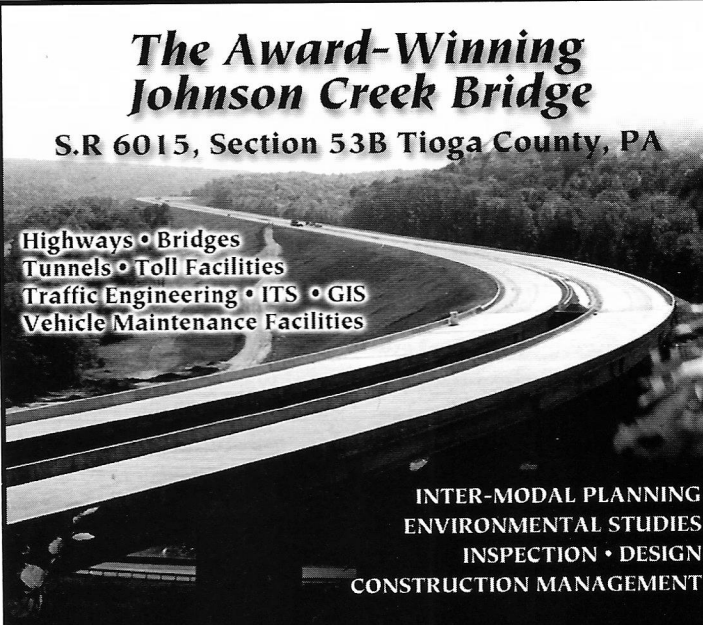
a structure is unattractive, chances are that it won't matter what you put on top of it. Bridges with a lot of added railings, tiers, and finishes can overshadow the beauty of the basic structure.

Another school of thought goes beyond the building basics. Some designers say it takes more than a good functional bridge to ensure that a bridge is attractive. "It's easy to say that aesthetics are part of a well-designed bridge structure," says Thomas Piotrowski, partner with H2L2 Architects and Planners (New York, NY), a design firm that focuses on architecture, planning, interior design, and infrastructure. "But there are requirements for different bridges, and generally aesthetics are not one of those requirements. There are crude and unimaginative ways of doing things, but usually you can find a better way."

And, some designers believe that a balance of form and function may be the best option. Rosales says, "I think aesthetics are inherent in good design, but they're not a straightforward kind of thing. It's more than just calculations—it's an artistic shaping of the bridge."

The article concludes that bridge designers who set out to design a "signature" bridge without first focusing on the basic functionality are likely to disappoint on both counts. ■


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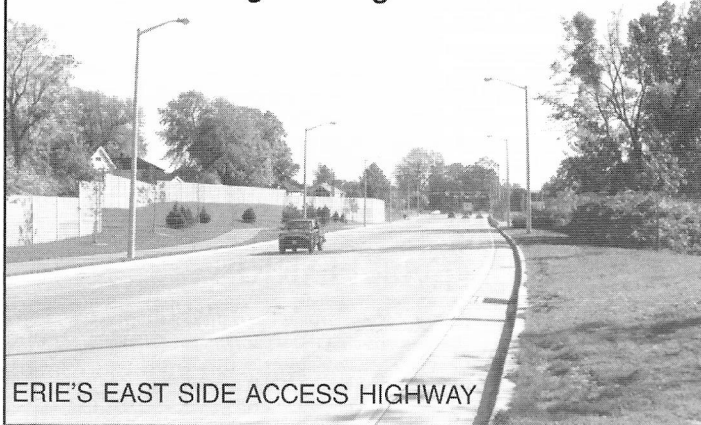
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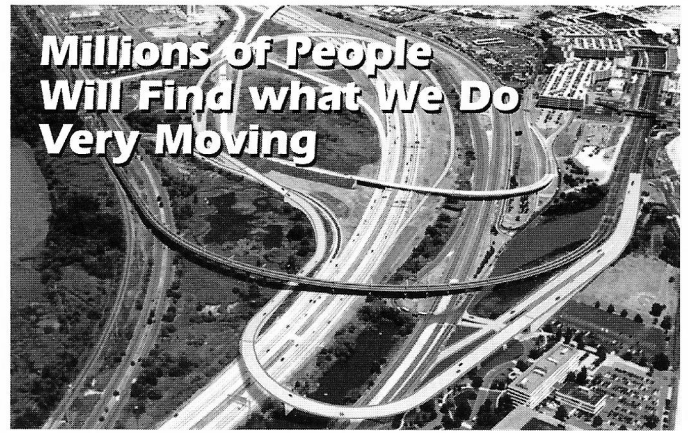
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Growing Greener

In Pursuit of Environmental Excellence: PENNDOT District 10's Quest for a Greener Tomorrow

By James B. Struzzi II

PENNDOT Engineering District 10 Community Relations Coordinator

In 1998, former Pennsylvania Governor Tom Ridge issued the Governor's Green Plan, an executive order that called for state agencies to improve their environmental performance. Following the lead of Transportation Secretary Brad Mallory, Engineering District 10 has taken this initiative to heart by aggressively implementing PENNDOT's Strategic Environmental Management Program (SEMP) in pursuit of ISO 14001 certification by December 2002.

Nestled in the heart of rolling farmland and blue mountain trout streams is the Pennsylvania Department of Transportation's five-county Engineering District 10. Visitors travel many miles to enjoy what the many State parks, waterways and outdoor settings in District 10 have to offer—a quality lifestyle set in an untouched natural environment that still includes the occasional cry of an eagle or the majestic image of a trophy buck.

District 10 intends to keep it that way. Encompassing Armstrong, Butler, Clarion, Indiana and Jefferson counties in Western Pennsylvania, a region known for its natural beauty and scenic ambiance, District 10 has a unique responsibility that requires maintaining a precarious balance between serving its customers and preserving and protecting the environment.

The New Horizon

"We choose to live in these areas because we appreciate the quality of life Western Pennsylvania provides," said Richard H. Hogg, District Engineer. "Most of our employees grew up hunting, fishing and hiking these same hills and valleys. This country is what we value, and together we are learning how to protect and preserve our homeland."



Through a partnership with local community groups in Indiana and the Western Pennsylvania Conservancy, the District office's front yard has been landscaped and planted with flowers and shrubs.

We consumed and consumed with little or no thought to conservation or protection until we realized that what we value most in this nation, our quality of life, would soon disappear if we continued our current course. Recognizing an opportunity to become better environmental stewards and preserve those qualities that the Keystone State represents, Pennsylvania decided to take a stand.

District 10 has followed Secretary Mallory's lead by taking this initiative to heart and aggressively implementing PENNDOT's Strategic Environmental Management Program (SEMP). Although the District has been growing more envi-

ronmentally conscious for the past several years, SEMP provides a comprehensive guide to implementing a green policy that the District, at all employee levels, can adhere to. Through implementation, the program sets the direction of the District's environmental efforts and demonstrates the commitment of PENNDOT's senior management in achieving this goal. It also demonstrates PENNDOT's commitment to the people of Pennsylvania.



Monitoring salt application rates and road-way and air temperatures and the use of deicing trucks like the one pictured above help the District's maintenance units use the proper amount of winter materials.

"By implementing a Strategic Environmental Management Program, we are listening to the voice of our customers," Hogg said. "Quality of life—environmental quality—is something we must strive diligently to preserve."

The implementation and use of SEMP is more than a mere outline for environmental controls; it is a systematic elevation of District 10's environmental consciousness. All employees, through education and training, will become stewards of the environment.

This means the District, through compliance with Federal and State environmental laws and regulations, will manage hazardous waste and materials, protect wetlands and sensitive streams and assess the environmental impacts of construction projects. It also involves conserving resources (fuel, deicing materials, stone, paper and electricity), recycling and reducing wastes and reducing the amount of pollutants released in the air, water, groundwater and soil.

SEMP identifies six Green Plan policy principles that the District must follow.

- Protect the environment and use resources efficiently.
- Continually identify ways to improve our performance.
- Set performance objectives and measure progress.
- Make sure employees understand these principles and furnish the means to fulfill them.
- Comply with environmental requirements.
- Use environmental performance improvement to meet customer needs.

By strict adherence to these principles, District 10 will transform its internal processes to better meet and serve the needs of the environment and Pennsylvania residents.

Where Does SEMP Guide District 10?

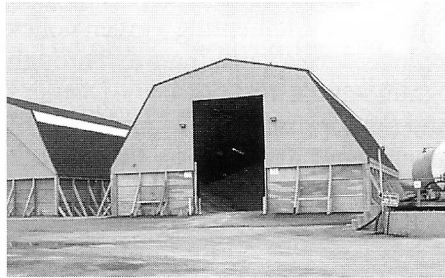
Led by Assistant District Administrator for Maintenance James E. Slaughenhoup, District 10 has pledged to become the first PENNDOT Engineering District to obtain International Organization for Standards (ISO) 14001 registration in three

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Growing Greener

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maintenance areas—winter maintenance, stockpile management, and erosion and sedimentation control—by December 2002. ISO is a non-governmental, international organization based in Geneva, Switzerland, with more than 100 member bodies, or countries.



Environmentally sound stockpile management includes proper storage of materials, drainage and the elimination of debris and chemical runoff.

PENNDOT's maintenance forces are the front line workers who work directly on the roadways. Their efforts directly impact the environment. Through SEMP, District 10 is making that impact a positive interaction.

"We are committed to this goal throughout all five county maintenance organizations and the District Office," Slaughenhoup said. "It is our responsibility to PENNDOT's customers in District 10 to obtain ISO registration. We have learned

to value our natural resources and achieving this goal will demonstrate our commitment to preserving them."

ISO registration means the District has demonstrated, through management initiatives and the deployment of best practices, systematic targets and goals for its environmental performance. It signifies the District's steadfast commitment to environmental excellence.

Slaughenhoup's goals for District 10's maintenance unit include the formation of SEMP implementation teams in each county. These groups are charged with mapping processes, training, communication and measurement to ensure each organization is on target for environmental performance success. The process to obtain ISO registration began last year.

The Future for Greener PENNDOT

"The bottom line for District 10 can be summarized in one phrase, 'Be a good neighbor,'" Hogg said. "We are a large part of the communities we serve. By becoming leaders in environmental stewardship, we are enhancing and protecting the world we live in. What could be more important than that?" ■

A Reflection on the Highway Engineer and ASHE

John Coy, President, Western Reserve Section

This organization that we are part of is based on the integrity of our work as professionals in the field of highway engineering. It is important to remember this while working on the wide scope of projects that we do in our daily lives. In a way, our job consists of providing the means to connect people all across the United States. Based on the events of September 11, this holds more meaning than ever before—our highways are the lifelines that keeps our country connected.

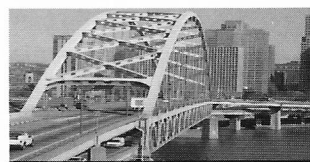
I recently suffered the loss of my mother and, because of the highway system, people that I never knew were able to come pay their respect to her. They came because they respected the work she did for American veterans. They traveled on highways that someone in the highway-engineering field worked on. Had these highways not been available, I might never have known how much my mother meant to so many people. As I thought about that, I felt good knowing that what I do for a living actually has a positive effect on so many people that I will never know.

Knowing this, it still amazes me to think that within a few days I can go from the northern part of Ohio to southern California. This is because of the modern highway engineer. The interstates, state routes, and county roads all provide people access to anywhere they need to go. These roadways are ever changing. And, today, ASHE looks for ways to improve the methods used to safely convey the increasing traffic on the highways.

This is what the highway engineer does—finds better ways to move people from their point of origin to their final destination. North, East, West and South (NEWS), we communicate

via the highways and bridges; they are the tools we use to convey to the American public that we are here and we care. It is important with every bridge calculation, horizontal curve, vertical curve or super elevation designed to remember that what is created by that design will impact people now and into the future.

That is why integrity is key when it comes to being a member of ASHE. I have met many people through my involvement with ASHE. I am glad to say many of them are now my friends who I look forward to seeing each year at meetings, social functions, or the annual conference. It really has been a pleasure being part of this organization, and I look forward to many years to come. Remember, if it wasn't for the highways I would never have learned so much about what my mother meant to people, and, for that, I am truly grateful and proud to be a member of ASHE.



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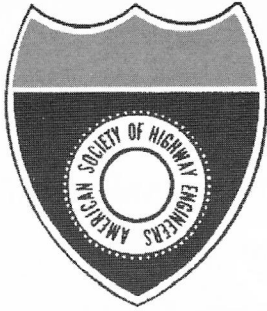
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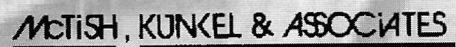
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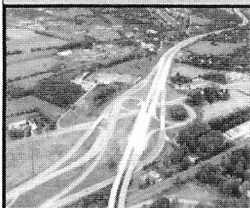
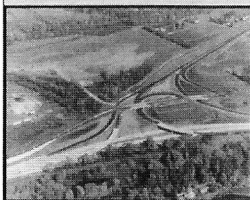


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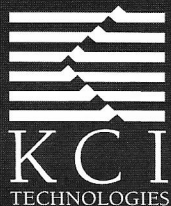
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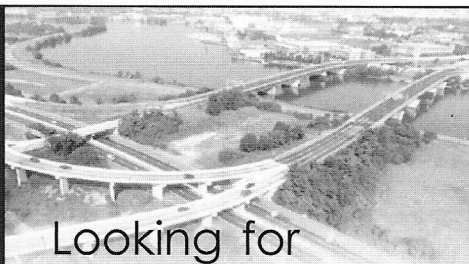


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Workforce Development Initiative

Finding quality employees is becoming a critical issue in the highway design and construction industry throughout the United States. Members of ASHE-Altoona Section agree and have determined that a "gap" exists between jobs that are available in the region and the available pool of potential applicants who have the skills required to obtain transportation-related jobs. How can the "gap" be bridged? To address this issue locally, the ASHE-Altoona Section has undertaken a public/private sector workforce development initiative.

The Education Committee will be targeting local engineering consulting firms, contractors, PENNDOT, and municipal governments to develop a needs assessment. The purpose of the needs assessment is to determine the extent of labor pool/jobs available "gap." The results of the needs assessment will help decide future courses of action by the committee. The information also will be used to request assistance from other workforce development efforts and to develop curriculum and training programs with local educational institutions.

At the regular section meeting on September 19, 2001, a workforce development panel discussion was held. Panel members included PENNDOT District Engineer Earl Nelderhiser, PE, the Executive Director of the Blair County Chamber of Commerce and the Workforce Development Coordinator of the Altoona-Blair County Development Corporation. ASHE members heard a lively discussion on the current and future educational needs of not only the transportation industry, but also other sectors of the economy. The panel concluded that a skilled workforce and economic development are inseparable and that Pennsylvania, as a whole, is demonstrating a strong commitment to workforce development.

How can the American Society of Highway Engineers play a role in the workforce development initiative? The Altoona Section's Education Committee, in addition to its ongoing needs assessment, will undertake an immediate action program to get involved. The workforce development program will have three phases.

Phase I – Targeting grade school students and making them aware of the Transportation Industry.

Phase II – Following up with the high school students.

Phase III – Developing a curriculum and training programs with local educational institutions.

Phase I will focus on giving students a simple task related to the transportation field, hence making them aware of what the transportation industry involves. Phase II will target high school students at all directions. It will include design and construction-related tasks and allow them to gain a hands-on perspective of various jobs in the transportation industry. Phase III will involve developing a curriculum and training programs to educate the high school graduates who are interested in a

technical field, as well as training local laborers to have the specific skill-set needed by highway industry employers.

We hope to implement Phase I by the Fall of 2002, beginning with the local schools. We hope that once we get the bugs worked out and develop a program that sparks the interest of the students, this program will expand to a national level.

Sandy Ivory, a member of the Altoona Section and incoming ASHE National President, attends the workforce development meetings and, in turn, keeps the ASHE National Board members informed on the program's progress. When the focus for the role of the ASHE-Altoona Section is defined, she hopes to have National adopt program guidelines for other interested ASHE Sections. ■

22/renew Honored as Nation's Top "Quality" Highway Project

continued from page 1

Partnership for Highway Quality (PPHQ) Award for Highest Quality Project Statewide and PPHQ awards for Congestion Management and Intelligent Transportation Systems, the 22/renew Public Information Campaign received the AASHTO Excel Awards for Best Public Information Campaign and Best Project Website. The project also has received the Honor Award for Engineering Excellence in Transportation from the Consulting Engineers Council of Pennsylvania and the ACPA National Award for Excellence in Concrete Pavement.

To receive more information about the 22/renew Project, please contact Matthew McTish, P.E., at 610-791-2700 or mpmctish@mctish.com. ■

Can You Help?

Are you involved in the planning, design, construction, maintenance or operations aspects of the highway industry? If so, more than likely you are benefiting from a recent advancement in technology to perform your job. We are requesting your help in producing articles for the SCANNER and the *Cross Section* that stimulate and publicize technological advances in the highway field for the benefit and career growth of our members.

Please contact Jeff Thompson, P.E., Technical Committee chairman for the Altoona Section for more details. He can be reached at jthomps@dot.state.pa.us or 412-429-4929. ■



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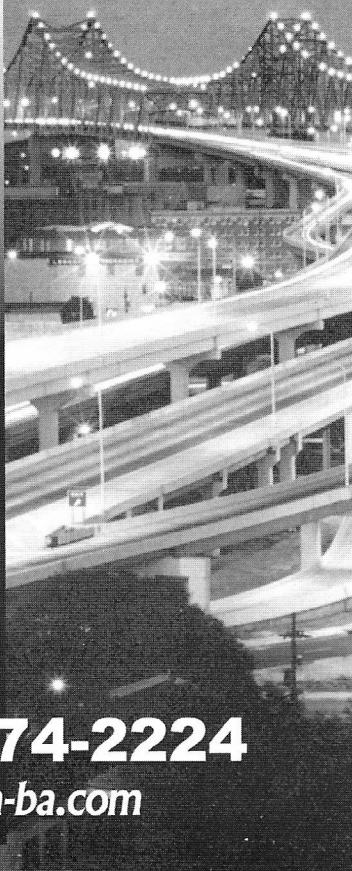
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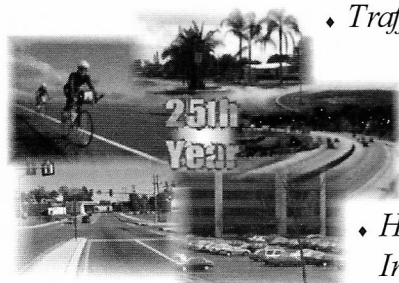
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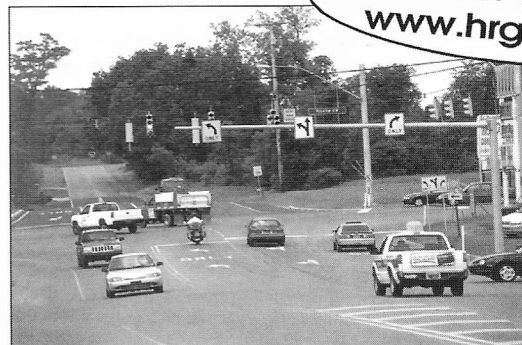
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Design-Build: The Royal Park Temporary Bascule Bridge

by G. Alan Klevens, P.E., Senior Associate and Steven A. Shaup, P.E., Senior Engineer
Lichtenstein Consulting Engineers, Inc.
ASHE Gold Coast Section

In September 1998, the State of Florida issued a Declaration of Emergency that allowed a design-build contract to be issued in January 1999 for the design, construction, three-year maintenance and operation, and removal of a temporary bascule bridge and fixed approach spans to carry four lanes across the Intracoastal Waterway in Palm Beach County, Florida. The aggressive schedule in the scope of work dictated that design and construction were to be completed within 12 months. Lichtenstein Consulting Engineers led the design team for PCL Civil Constructors, Inc., who was low bidder at approximately \$10.6 million. Construction featured innovative steel-framed bascule piers and reuse of the existing bascule leafs by floating the leafs into position using barges. The project received a 2001 National Design-Build Award from the Design-Build Institute of America.

Background

The original parallel bridges with rolling lift movable spans connected the City of West Palm Beach and the Town of Palm Beach in Florida and were constructed in 1929 and 1959. During a 1997 routine underwater inspection, extensive marine borer damage was discovered in the timber piles supporting the 1929 structure. The deterioration was so extensive that the Florida Department of Transportation (FDOT) instrumented and load tested the structure. In 1998, measuring permanent deflection at one of the piers of the 1929 structure, FDOT permanently closed the two lanes carried by this bridge. As the newer structure depended on the older structure for its lateral stability, the entire structure was in danger of collapsing. Based on these facts, the State of Florida issued its Declaration and the project was fast-tracked to bid.

Design Features

To complete the project under budget, the design team worked with the Contractor to develop structural systems that would minimize construction time and costs. To minimize construction time, systems were designed to allow simultaneous on-site construction and off-site fabrication. To reduce construction costs by minimizing demolition and disposal costs and maximizing salvage value, steel components were designed that could be reused after removal from the bridge.

For the fixed approach span bents and bascule piers, steel pipe piles were used. The preferred size of the pipe piles was chosen by the Contractor to ensure that the piles had maximum value to them after demolition of the bridge. The pipe piles had great bending strength, so the use of battered piles was avoided, except where the channel was the deepest.

For the fixed approach span superstructure and intermediate bent caps, rolled steel beams were used at most locations. The steel bent caps were designed so that they could later be separated at the field splice and used as construction crane bents on future projects. Sizes were selected that were in the Contractor's inventory or could be easily purchased with no lead time.

Remaining intermediate bent caps were of concrete precast construction, fabricated in two pieces in an off-site casting yard after as-built surveys were taken of the driven piles. The two pieces were placed atop the driven steel piles, grouted to the piles and joined together by a concrete closure pour.

The bascule piers were fabricated as a steel truss system. This system allowed the Contractor to fabricate the system off site while on-site construction proceeded. The steel frame was designed to be used initially during construction as a pile driving template and then in service for the bracing and horizontal load carrying system of the bascule piers. By using the frame as a pile driving template, the contractor ensured that the piles would be driven in the design location, within the tolerances required by the rolling lift bascule spans. The system works by distributing vertical and horizontal loads from the most severely loaded piles to adjacent piles through the bracing system. Component sizes for the bracing and load distribution system, consisting of wide flange steel sections, were selected from the Contractor's inventory or were most readily available and could be easily purchased with no lead time. Using steel-framed bascule piers allowed for a major savings in the demolition cost of the structure.

The flat tread castings for the existing structure were reused; after cleaning, the castings were shop-bolted to a steel wide flange shape to provide strength and properly support the castings within the required mechanical tolerances for flatness. This assembly was brought into the field and bolted to a set of W920 (W36) shapes shop-welded together side by side and positioned on a steel cap plate atop the driven piles. The side by side W920's (W36) provided the field adjustment necessary to position the bascule leafs on the flat tread castings.

Reuse of Existing Bascule Leafs

The existing bascule leafs were moved, one at a time, from their original location into place on the new steel-framed bascule piers by varying the water levels inside the barge compartments and using the tide to raise and lower the leafs. The waterway was closed to boat traffic while the barge was put into position and one leaf was removed from the existing structure. Once done, the barge was towed to a nearby sand bar and boat traffic allowed to resume. The flat tread castings were then removed, sent to the shop for cleaning and bolting to the wide flange shape, and reinstalled on the new bascule piers. The barge with the removed bascule leaf was then towed to the new bascule pier, where it was placed on the reused tread castings. This method of reusing the bascule leafs did not require demolition of the existing concrete counterweights, saving time and cost.

Project Completion

The structure was opened to traffic in January 2000, within the allowable contract time dictated by FDOT. With the milestone bonus achieved, and authorized contract changes be-

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Design-Build: The Royal Park Temporary Bascule Bridge

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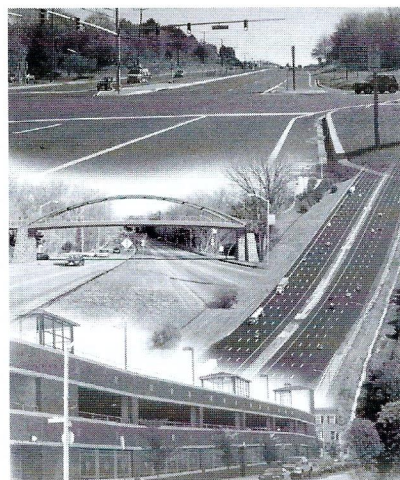
cause of unforeseen conditions that could not have been assumed at the time of bid, the final contract value was approximately \$11.2 million.

The project received the 2001 Design-Build Institute of America National Design-Build Award in the civil, under \$15 million category. ■



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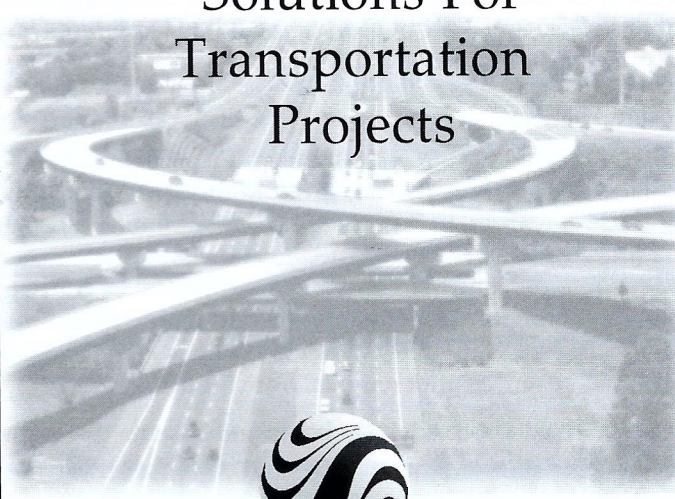
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Reconstruction of the Ohio Turnpike Bridge Over the Cuyahoga River Valley

by Robert Sobnosky, PE, Cuyahoga Valley Section

As part of the Ohio Turnpike Commission's ongoing Modernization Program, the Ohio Turnpike Structure over the Cuyahoga River Valley is being completely rebuilt.

The original bridge, built from 1952–1955, is a twin structure steel truss system with multiple girders and 12 solid pier columns. The existing pavement contains two 12' lanes and 10' and 8' shoulders. The cost of the original structure was \$6 million.

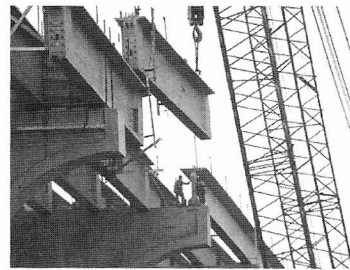


After careful review of the existing structure and the desired configuration to widen

the pavement to three lanes in each direction, the Ohio Turnpike Commission decided to rebuild instead of rehabilitate this structure for the following reasons:

- **Lead Paint:** The costs to remove and repaint the structural steel was \$10 million in 1990. These costs would be even greater today given the stricter controls and containment systems required for this process. Furthermore, containment of any aging paint system would be a concern with respect to the ecologically sensitive Cuyahoga Valley National Park beneath the bridge.
- **Concrete Spalling on the Underside of the Bridge Deck:** Minor spalling is a safety concern for pedestrian, auto, and railroad traffic crossing beneath the structure.
- **Concrete Pier Damage:** The existing piers, last rehabilitated in 1979, are showing signs of aging.
- **Feasibility of Widening the Deck on the Existing Structure:** The existing substructure could not support the addition of a third lane and a 10' shoulder and a 14' shoulder.
- **Safety:** Rehabilitative construction activity would require either conducting construction activity and live traffic on the same structure simultaneously or placing bidirectional traffic on one of the twin structures while rehabilitating the other. Given the length, height, and width of the existing structures, neither of these traffic scenarios was acceptable.
- **Cost:** Rehabilitation costs were estimated to be about 75% of the cost of building a new structure.

The new bridge, designed by HNTB, features a process new to Ohio. The prestressed concrete girders were "dropped-in" place and then post-tensioned. To build the long spans in the center portion of the bridge, balanced cantilever beams were placed on two adjacent piers. A drop-in beam then was used to close the gap between the cantilevered beams. The drop-in beams were held in place by crane until secured at both ends. Finally, the entire 900' section of cantilevered and drop-in



beams was post-tensioned. This post-tensioned section is 900' in length and 175' above the floor of the Cuyahoga Valley.

The use of the concrete girders over more traditional steel girders resulted in a

cost savings of about \$1.4 million. The new structures have the following features:

- \$52 million cost
- 2,664' in length
- Maximum height of 175' above the valley floor
- 17 hollow piers for each structure
- Three 12' lanes and one 10' shoulder and one 14'-3" shoulder
- 5,600 CY of concrete in the beams for each structure
- 5,027 CY of concrete in the deck of each structure
- 1.8 million pounds of reinforcing steel in the deck of each structure
- 14,560 CY of concrete in the substructure of each pier
- 42.95 miles of post-tensioning strand for each structure
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As with any construction project, several obstacles had to be overcome thus far. Highlights of the project to this point are as follows:

- **Wetland Mitigation:** The structure, relocated 100' south of its present location, disturbed 3.56 acres of wetlands. To compensate for this, 8.46 acres of wetlands were enhanced to a higher quality than the disturbed wetlands at another location in the national park.
- **Cuyahoga River Crossing:** A portion of the project required the contractor to access land bound by the Cuyahoga River to the east and a steep slope to the west. The contractor utilized a temporary low-flow river crossing approved by the Army Corps of Engineers. The low-flow crossing consisted of 12 lengths of 48" x 60' steel conduit placed in the Cuyahoga River parallel to the banks. The pipe was covered with 2' of type C rock. This allowed for construction vehicles to cross the river at low flow.
- **The Tow Path:** A section of temporary Tow Path was built parallel to the existing Tow Path under the bridge. This ensured that either the original or temporary Tow Path would be continuously open for use.
- **Right-of-Way Restrictions:** The south side of the west approach to the bridge was constrained by Right-of-Way. Geogrid engineering fill was used so that the roadway embankment did not extend beyond the limits of the Turnpike's property.

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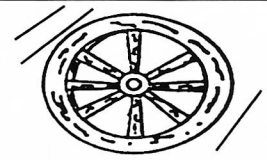
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AS THE WHEEL TURNS...



At the helm of Urban Engineers, Inc. is the newly recognized Engineer of the Year. **Edward M. D'Alba, PE**, earned accolades from many of his clients and peers who serve on the Delaware Valley Engineer's Week Council and was named the Council's Engineer of the Year for 2002.

D'Alba progressed through the ranks of Urban to project manager, branch manager, vice president, and in 1993, president and chief executive officer. He holds a master's degree in Civil and Urban Engineering from the University of Pennsylvania and a bachelor's degree in Civil Engineering from Worcester Polytechnic Institute. D'Alba is a registered professional engineer in five states and a registered professional land surveyor in Pennsylvania.

Edward M. D'Alba, PE, president of Urban Engineers, Inc., announced that **Pasquale (Pat) Dougherty** has joined the firm as senior project manager in the highway and bridge division.

Mr. Dougherty has 33 years of professional experience in highway design, including such notable projects as the Schuylkill Expressway reconstruction and Interstate Route 95 reconstruction through Philadelphia.

A registered professional engineer and professional land surveyor in Pennsylvania, Mr. Dougherty holds a master's and bachelor's degree in civil engineering from Villanova University. He is a member of the American Society of Highway Engineers (ASHE), the American Society of Civil Engineers, the Institute of Traffic Engineers, and the Engineers Club of Philadelphia. In 1997, he served as national president of ASHE. Mr. Dougherty was elected Engineer of the Year for 2001 by the Delaware Valley Engineers Week Committee.

Johnson, Mirmiran & Thompson (JMT) is pleased to announce that **Rick J. DeLong, PE**, has joined JMT's Richmond office as Senior Associate and Chief of Highways for our Virginia operations. Mr. DeLong has more than nine years of experience in the design and management of highway, structural, and drainage related projects.

Mr. DeLong has project experience in rural, urban and interchange design for VDOT and other agencies including municipalities in Virginia, PENNDOT and DelDOT. Notable projects for which he has served as Project Manager or in a lead capacity include the Route 58 design in Carroll County, Route I-81 widening and interchange improvements in Roanoke County, the I-64/Bland Boulevard feasibility study in the City of Newport News, Route 337 widening and intersection improvements in the City of Suffolk, and the North Newport News Community Improvement and Menchville Road projects in the Newport News.

Mr. DeLong earned a Bachelor of Science degree in Civil Engineering from the Pennsylvania State University. He is a registered professional engineer in Virginia and a member of the American Society of Highway Engineers. ■



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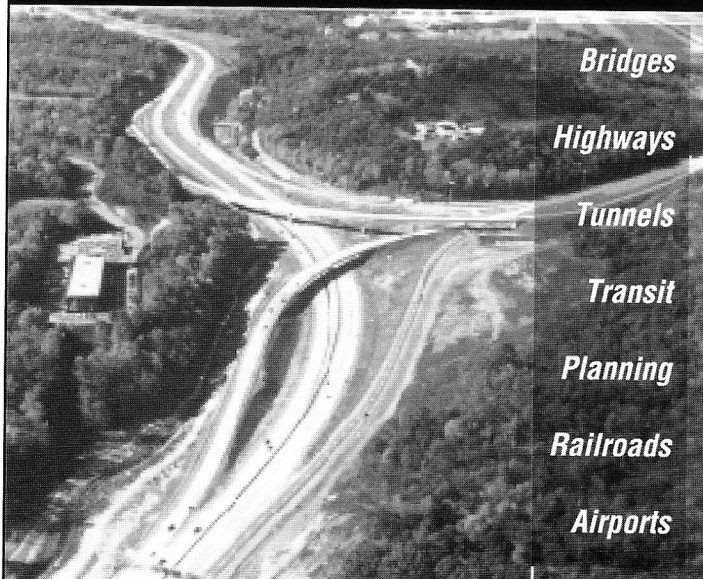
Reconstruction of the Ohio Turnpike Bridge Over the Cuyahoga River Valley

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- **Riverview Road Landslide Correction:** The contract for this project encompassed work for the Summit County Engineer. Riverview Road, which runs under the structure, required correction of a landslide threatening the embankment supporting the road itself. The landslide was corrected with Tensar-Geogrid reinforcement. To complete the Riverview Road correction, 550' of full-depth roadway was reconstructed and grading and drainage improvements were put in place.
- **Demolition of Existing Structure:** The concrete deck will be saw cut and removed by hydraulic excavators. The demolition of most of the steel truss will be accomplished using shape charges. The first section of the steel truss was demolished by this method on November 12, 2001. The remainder of the steel truss was demolished on January 12, 2002.

Construction of the new bridge began in October 1999. The new eastbound structure opened to traffic on October 12, 2001. The westbound structure is scheduled to be open to traffic in October 2003. The final completion date will be in 2004. ■

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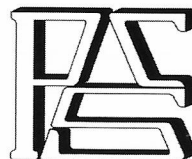
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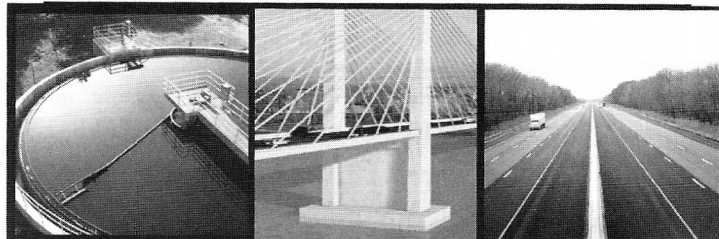
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